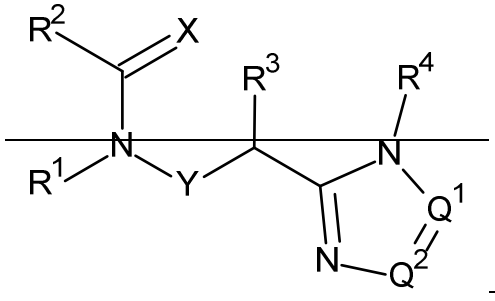
Claims:

1. Compound of the formula (I)



(I),

in which

X is O or S;

Q^1 and Q^2 are independently CR^5 or N, provided at least one of Q^1 and Q^2 is N;

Y is a direct bond or CH_2;

R^1 is hydrogen; C_1-C_6alkyl optionally substituted with one substituent selected from CN, $CONH_2$, COOH, NO_2 and $Si(CH_3)_3$; C_1-C_6haloalkyl; C_2-C_6alkenyl; C_2-C_6haloalkenyl; C_2-C_6alkynyl; C_2-C_6haloalkynyl; C_3-C_4cycloalkyl C_1-C_2alkyl wherein the C_3-C_4cycloalkyl is optionally substituted with one or two halogen atoms; oxetan-3-yl CH_2- or benzyl optionally substituted with halogen atoms or C_1-C_3haloalkyl;

R^2 is phenyl, pyridine, pyrimidine, pyrazine or pyridazine, wherein the phenyl, pyridine, pyrimidine, pyrazine or pyridazine is optionally substituted with one to three substituents, provided the substituent(s) are not on either carbon adjacent to the carbon bonded to the C=X group, each independently selected from the group consisting of C_1-C_3alkyl, C_1-C_3haloalkyl, C_1-C_3haloalkylthio, C_1-C_3alkoxy, C_1-C_3haloalkoxy, halogen, NO_2, SF_5, CN, $CONH_2$, COOH and $C(S)NH_2$;

R^3 is C_1-C_3alkyl or C_1-C_3haloalkyl;

R^4 is pyridine, pyrimidine, pyrazine or pyridazine, wherein the pyridine, pyrimidine, pyrazine or pyridazine is substituted with two to three substituents independently selected from the group consisting of

halogen, hydroxy, CN, COOH, SO_2NH_2, $CONH_2$, $CSNH_2$, NO_2, SF_5, NH_2;

and in each case optionally substituted C_1-C_6alkyl, C_3-C_6cycloalkyl, C_1-C_6haloalkyl, C_1-C_6alkoxy, C_1-C_6haloalkoxy, C_1-C_6alkylthio, C_1-C_6alkylsulfinyl, C_1-C_6alkylsulfonyl, C_3-C_6cycloalkylsulfanyl, C_3-C_6cycloalkylsulfinyl, C_3-C_6cycloalkylsulfonyl, C_1-C_6haloalkylthio, C_1-C_6haloalkylsulfinyl, C_1-C_6haloalkylsulfonyl, NH(C_1-C_6alkyl), N(C_1-C_6alkyl)$_2$, NHCO-C_1-C_6alkyl, N(C_1-C_6alkyl)CO-C_1-C_6alkyl, $CO_2$$C_1$-$C_6$alkyl, CONH($C_1$-$C_6$alkyl), CON($C_1$-$C_6$alkyl)$_2$, C(=NO$C_1$-$C_6$alkyl)H, C(=NO$C_1$-$C_6$alkyl)-$C_1$-$C_6$alkyl, phenyl and 5- to 6-membered heteroaryl;

or

R^4 is pyridine, pyrimidine, pyrazine or pyridazine, wherein the pyridine, pyrimidine, pyrazine or pyridazine is substituted with a total of one to three substituent(s), provided at least one and up to three substituent(s) are independently selected from group A consisting of

CN, COOH, SO_2NH_2, $CONH_2$, $CSNH_2$, NO_2, SF_5, NH_2, substituted C_3-C_4cycloalkyl;

and C_1-C_3alkyl and C_1-C_3alkoxy, both substituted by one to three substituents independently selected from the group consisting of NH_2, OH, NO_2, CN, SH, $CO_2$$C_1$-$C_4$alkyl, $CONH_2$, SF_5, SO_2NH_2, C_3-C_4cycloalkyl, C_2-C_4alkenyl, C_5-C_6cycloalkenyl, C_2-C_4alkynyl, NH(C_1-C_6alkyl), N(C_1-C_6alkyl)$_2$, *N*-C_1-C_4alkanoylamino, C_1-C_4alkoxy, C_1-C_4haloalkoxy, C_2-C_4alkenyloxy, C_2-C_4alkynyloxy, C_3-C_4cycloalkoxy, C_5-C_6cycloalkenyloxy, C_1-C_4alkoxycarbonyl, C_2-C_4alkenyloxycarbonyl, C_2-C_4alkynyloxycarbonyl, C_6-,C_{10}-,C_{14}-aryloxycarbonyl, C_1-C_4alkanoyl, C_2-C_4alkenylcarbonyl, C_2-C_4alkynylcarbonyl, C_6-,C_{10}-,C_{14}-arylcarbonyl, C_1-C_4alkylthio, C_1-C_4haloalkylthio, C_3-C_4cycloalkylthio, C_2-C_4alkenylthio, C_5-C_6cycloalkenylthio, C_2-C_4alkynylthio, C_1-C_4alkylsulfinyl, C_1-C_4haloalkylsulfinyl, C_1-C_4alkylsulfonyl, C_1-C_4haloalkylsulfonyl, SO_2-NH(C_1-C_6alkyl), SO_2-N(C_1-C_6alkyl)$_2$, C_1-C_4alkylphosphinyl, C_1-C_4alkylphosphonyl, *N*-C_1-C_4alkylaminocarbonyl, *N,N*-di-C_1-C_4alkylaminocarbonyl, *N*-C_1-C_4alkanoylaminocarbonyl, *N*-C_1-C_4alkanoyl-N-C_1-C_4alkylaminocarbonyl, C_6-,C_{10}-,C_{14}-aryl, C_6-,C_{10}-,C_{14}-aryloxy, benzyl, benzyloxy, benzylthio, C_6-,C_{10}-,C_{14}-arylthio, C_6-,C_{10}-,C_{14}-arylamino, benzylamino, heterocyclyl, heteroaryl and trialkylsilyl, and substituents bonded via a double bond, such as C_1-C_4alkylidene (e.g. methylidene or ethylidene), an oxo group, an imino group and a substituted imino group;

~~and in each case optionally substituted CO_2-C_1-C_6alkyl, C_5-C_6cycloalkyl, C_4-C_6alkyl, C_4-C_6haloalkyl, C_4-C_6alkoxy, C_1-C_6haloalkoxy, C_1-C_6alkylthio, C_1-C_6alkylsulfinyl, C_1-C_6alkylsulfonyl, C_3-C_6cycloalkylsulfanyl, C_3-C_6cycloalkylsulfinyl, C_3-C_6cycloalkylsulfonyl, C_1-C_6haloalkylthio, C_1-C_6haloalkylsulfinyl, C_1-C_6haloalkylsulfonyl, C_2-C_4alkenylsulfanyl, C_2-C_4alkenylsulfinyl, C_2-C_4alkenylsulfonyl, C_2-C_4alkinylsulfanyl, C_2-C_4alkinylsulfinyl, C_2-C_4alkinylsulfonyl, phenylsulfanyl, phenylsulfinyl, phenylsulfonyl, S-C_1-C_6alkylsulfinimidoyl, S-C_3-C_6cycloalkylsulfinimidoyl, S-C_2-C_6alkenylsulfinimidoyl, S-C_2-C_6alkinylsulfinimidoyl, S-phenylsulfinimidoyl, S-C_1-C_6alkylsulfonimidoyl, S-C_3-C_6cycloalkylsulfonimidoyl, S-C_2-C_6alkenylsulfonimidoyl, S-C_2-C_6alkinylsulfonimidoyl, S-phenylsulfonimidoyl, NH(C_1-C_6alkyl), N(C_1-C_6alkyl)$_2$, -NHCO-C_1-C_6alkyl, -N(C_1-C_6alkyl)CO-C_1-C_6alkyl, -N(C_3-C_6cycloalkyl)CO-C_1-C_6alkyl, -NHCO-C_3-C_6cycloalkyl, NHCO-C_1-C_6alkyl-C_3-C_6cycloalkyl, N(C_1-C_6alkyl)CO-(C_3-C_6cycloalkyl), N(C_3-C_6cycloalkyl)CO-(C_3-C_6cycloalkyl), N(C_1-C_6alkyl)CO-phenyl, N(C_3-C_6cycloalkyl)CO-phenyl, -NHCO-phenyl, N(CO-C_1-C_6alkyl)$_2$, N(CO-C_3-C_6cycloalkyl)$_2$, N(CO-phenyl)$_2$, N(CO-C_3-C_6cycloalkyl)(CO-C_1-C_6alkyl), N(CO-C_3-C_6cycloalkyl)(CO-phenyl), N(CO-C_1-C_6alkyl)(CO-phenyl), CONH(C_1-C_6alkyl), CON(C_1-C_6alkyl)$_2$, CONH(C_3-C_6cycloalkyl), CON(C_1-C_6alkyl)(C_3-C_6cycloalkyl), CON(C_3-C_6cycloalkyl)$_2$, CONH-SO_2-C_1-C_6alkyl, -CONH-SO_2-phenyl, -CONH-SO_2-(C_3-C_6cycloalkyl), CON(C_1-C_6alkyl)-SO_2-C_1-C_6alkyl, CON(C_1-C_6alkyl)-SO_2-phenyl, CON(C_1-C_6alkyl)-SO_2-(C_3-C_6cycloalkyl), CONH-phenyl, CON(C_1-C_6alkyl)phenyl, CON(C_3-C_6cycloalkyl)phenyl, N(SO_2C_1-C_6alkyl)$_2$, N(SO_2C_1-C_6haloalkyl)$_2$, N(SO_2C_3-C_6cycloalkyl)$_2$, N(SO_2C_1-C_6alkyl)SO_2-phenyl, N(SO_2C_3-C_6cycloalkyl)SO_2-phenyl, -NHSO$_2$-C_1-C_6alkyl, -NHSO$_2$-C_1-C_6haloalkyl, -N(C_1-C_6alkyl)SO$_2$-C_1-C_6alkyl, -N(C_3-C_6cycloalkyl)SO$_2$-C_1-C_6alkyl, -NHSO$_2$-phenyl, -N(C_1-C_6alkyl)SO$_2$-phenyl, -N(C_3-C_6cycloalkyl)SO$_2$-phenyl, -NHSO$_2$-C_3-C_6cycloalkyl, -N(C_1-C_6alkyl)SO$_2$-(C_3-C_6cycloalkyl), -N(C_3-C_6cycloalkyl)SO$_2$-(C_3-C_6cycloalkyl), -SO$_2$NH(C_1-C_6alkyl), -SO$_2$N(C_1-C_6alkyl)$_2$, -SO$_2$N(C_1-C_6alkyl)(C_3-C_6cycloalkyl), -SO$_2$NH(C_3-C_6cycloalkyl), -SO$_2$N(C_3-C_6cycloalkyl)$_2$, -SO$_2$NH(phenyl), -SO$_2$N(C_1-C_6alkyl)(phenyl), -SO$_2$N(C_1-C_4cycloalkyl)(phenyl), -NHCS-C_1-C_6alkyl, -N(C_1-C_6alkyl)CS-C_1-C_6alkyl, -N(C_3-C_6cycloalkyl)CS-C_1-C_6alkyl, -NHCS-C_3-C_6cycloalkyl, -N(C_1-C_6alkyl)CS-(C_3-C_6cycloalkyl), -N(C_3-C_6cycloalkyl)CS-(C_3-C_6cycloalkyl), -N(C_1-C_6alkyl)CS-phenyl, -N(C_3-C_6cycloalkyl)CS-phenyl, -NHCS-phenyl, -CSNH(C_1-C_6alkyl), -CSN(C_1-~~

~~C_6alkyl)$_2$, CSNH(C_3-C_6cycloalkyl), CSN(C_1-C_6alkyl)(C_3-C_6cycloalkyl), CSN(C_3-C_6cycloalkyl)$_2$, CSNH phenyl, CSN(C_1-C_6alkyl)phenyl, CSN(C_3-C_6cycloalkyl)phenyl, C(=NOC_1-C_6alkyl)H, C(=NOC_1-C_6alkyl) C_1-C_6alkyl, phenyl and 5- to 6-membered heteroaryl;~~

~~and the other one to two optional substituent(s) are each independently selected from group B consisting of~~

~~halogen, hydroxy, CN, COOH, $CONH_2$, NO_2, NH_2;~~

~~and in each case optionally substituted C_1-C_6alkyl, C_3-C_6cycloalkyl, C_1-C_6haloalkyl, C_1-C_6alkoxy, C_1-C_6haloalkoxy, C_1-C_6alkylthio, C_1-C_6alkylsulfinyl, C_1-C_6alkylsulfonyl, C_1-C_6haloalkylthio, C_1-C_6haloalkylsulfinyl, C_1-C_6haloalkylsulfonyl, NH(C_1-C_6alkyl), N(C_1-C_6alkyl)$_2$, NHCO-C_1-C_6alkyl, N(C_1-C_6alkyl)CO-C_1-C_6alkyl, CO_2C_1-C_6alkyl, CONH(C_1-C_6alkyl), CON(C_1-C_6alkyl)$_2$, C(=NOC_1-C_6alkyl)H, C(=NOC_1-C_6alkyl) C_1-C_6alkyl, phenyl and 5- to 6-membered heteroaryl;~~

~~or~~

~~R^4 is a 5-membered heteroaryl optionally substituted with one to three substituents independently selected from the group consisting of~~

~~halogen, hydroxy, CN, COOH, $CONH_2$, $CSNH_2$, SO_2NH_2, NO_2, SF_5, NH_2;~~

~~and in each case optionally substituted CO_2-C_1-C_6alkyl, C_1-C_6alkyl, C_3-C_6cycloalkyl, C_1-C_6haloalkyl, C_1-C_6alkoxy, C_1-C_6haloalkoxy, C_1-C_6alkylthio, C_1-C_6alkylsulfinyl, C_1-C_6alkylsulfonyl, C_3-C_6cycloalkylsulfanyl, C_3-C_6cycloalkylsulfinyl, C_3-C_6cycloalkylsulfonyl, C_1-C_6haloalkylthio, C_1-C_6haloalkylsulfinyl, C_1-C_6haloalkylsulfonyl, C_2-C_4alkenylsulfanyl, C_2-C_4alkenylsulfinyl, C_2-C_4alkenylsulfonyl, C_2-C_4alkinylsulfanyl, C_2-C_4alkinylsulfinyl, C_2-C_4alkinylsulfonyl, phenylsulfanyl, phenylsulfinyl, phenylsulfonyl, S-C_1-C_6alkylsulfinimidoyl, S-C_3-C_6cycloalkylsulfinimidoyl, S-C_2-C_6alkenylsulfinimidoyl, S-C_2-C_6alkinylsulfinimidoyl, S-phenylsulfinimidoyl, S-C_1-C_6alkylsulfonimidoyl, S-C_3-C_6cycloalkylsulfonimidoyl, S-C_2-C_6alkenylsulfonimidoyl, S-C_2-C_6alkinylsulfonimidoyl, S-phenylsulfonimidoyl, NH(C_1-C_6alkyl), N(C_1-C_6alkyl)$_2$, NHCO-C_1-C_6alkyl, N(C_1-C_6alkyl)CO-C_1-C_6alkyl, N(C_3-~~

~~C_6cycloalkyl)CO-C_1-C_6alkyl, -NHCO-C_3-C_6cycloalkyl, -N(C_1-C_6alkyl)CO-(C_3-C_6cycloalkyl), -N(C_3-C_6cycloalkyl)CO-(C_3-C_6cycloalkyl), -N(C_1-C_6alkyl)CO-phenyl, -N(C_3-C_6cycloalkyl)CO-phenyl, -NHCO-phenyl, -N(CO-C_1-C_6alkyl)$_2$, -N(CO-C_3-C_6cycloalkyl)$_2$, -N(CO-phenyl)$_2$, -N(CO-C_3-C_6cycloalkyl)(CO-C_1-C_6alkyl), -N(CO-C_3-C_6cycloalkyl)(CO-phenyl), -N(CO-C_1-C_6alkyl)(CO-phenyl), -CONH(C_1-C_6alkyl), -CON(C_1-C_6alkyl)$_2$, -CONH(C_3-C_6cycloalkyl), -CON(C_1-C_6alkyl)(C_3-C_6cycloalkyl), -CON(C_3-C_6cycloalkyl)$_2$, -CONH-SO_2-C_1-C_6alkyl, -CONH-SO_2-phenyl, -CONH-SO_2-(C_3-C_6cycloalkyl), -CON(C_1-C_6alkyl)-SO_2-C_1-C_6alkyl, -CON(C_1-C_6alkyl)-SO_2-phenyl, -CON(C_1-C_6alkyl)-SO_2-(C_3-C_6cycloalkyl), -CONH-phenyl, -CON(C_1-C_6alkyl)phenyl, -CON(C_3-C_6cycloalkyl)phenyl, -N(SO_2C_1-C_6alkyl)$_2$, -N(SO_2C_1-C_6haloalkyl)$_2$, -N(SO_2C_3-C_6cycloalkyl)$_2$, -N(SO_2C_1-C_6alkyl)SO_2-phenyl, -N(SO_2C_3-C_6cycloalkyl)SO_2-phenyl, -NHSO$_2$-C_1-C_6alkyl, -NHSO$_2$-C_1-C_6haloalkyl, -N(C_1-C_6alkyl)SO_2-C_1-C_6alkyl, -N(C_3-C_6cycloalkyl)SO_2-C_1-C_6alkyl, -NHSO$_2$-phenyl, -N(C_1-C_6alkyl)SO_2-phenyl, -N(C_3-C_6cycloalkyl)SO_2-phenyl, -NHSO$_2$-C_3-C_6cycloalkyl, -N(C_1-C_6alkyl)SO_2-(C_3-C_6cycloalkyl), -N(C_3-C_6cycloalkyl)SO_2-(C_3-C_6cycloalkyl), -SO_2NH(C_1-C_6alkyl), -SO_2N(C_1-C_6alkyl)$_2$, -SO_2N(C_1-C_6alkyl)(C_3-C_6cycloalkyl), -SO_2NH(C_3-C_6cycloalkyl), -SO_2N(C_3-C_6cycloalkyl)$_2$, -SO_2NH(phenyl), -SO_2N(C_1-C_6alkyl)(phenyl), -SO_2N(C_1-C_4cycloalkyl)(phenyl), -NHCS-C_1-C_6alkyl, -N(C_1-C_6alkyl)CS-C_1-C_6alkyl, -N(C_3-C_6cycloalkyl)CS-C_1-C_6alkyl, -NHCS-C_3-C_6cycloalkyl, -N(C_1-C_6alkyl)CS-(C_3-C_6cycloalkyl), -N(C_3-C_6cycloalkyl)CS-(C_3-C_6cycloalkyl), -N(C_1-C_6alkyl)CS-phenyl, -N(C_3-C_6cycloalkyl)CS-phenyl, -NHCS-phenyl, -CSNH(C_1-C_6alkyl), -CSN(C_1-C_6alkyl)$_2$, -CSNH(C_3-C_6cycloalkyl), -CSN(C_1-C_6alkyl)(C_3-C_6cycloalkyl), -CSN(C_3-C_6cycloalkyl)$_2$, -CSNH-phenyl, -CSN(C_1-C_6alkyl)phenyl, -CSN(C_3-C_6cycloalkyl)phenyl, -C(=NOC$_1$-C_6alkyl)H, -C(=NOC$_1$-C_6alkyl)-C_1-C_6alkyl, phenyl and 5- to 6-membered heteroaryl;~~

~~or~~

~~R^4 is a heterocyclic ring which is selected from the group consisting of 4- to 10-membered saturated or partially unsaturated heterocyclyl, 9-membered heteroaryl and 10-membered heteroaryl, each of which is optionally substituted by one to three substituents independently selected from the group consisting of~~

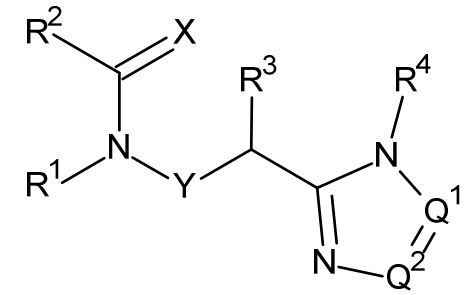
~~halogen, =O (oxo), hydroxy, -CN, -COOH, -SO_2NH_2, -$CONH_2$, -$CSNH_2$, -NO_2, -SF_5, -NH_2;~~

and in each case optionally substituted CO_2-C_1-C_6alkyl, C_1-C_6alkyl, C_3-C_6cycloalkyl, C_3-C_6cycloalkyl-C_1-C_6alkyl, C_1-C_6haloalkyl, C_1-C_6alkoxy, C_1-C_6haloalkoxy, C_1-C_6alkylthio, C_1-C_6alkylsulfinyl, C_1-C_6alkylsulfonyl, C_3-C_6cycloalkylsulfanyl, C_3-C_6cycloalkylsulfinyl, C_3-C_6cycloalkylsulfonyl, C_1-C_6haloalkylthio, C_1-C_6haloalkylsulfinyl, C_1-C_6haloalkylsulfonyl, C_2-C_4alkenylsulfanyl, C_2-C_4alkenylsulfinyl, C_2-C_4alkenylsulfonyl, C_2-C_4alkinylsulfanyl, C_2-C_4alkinylsulfinyl, C_2-C_4alkinylsulfonyl, phenylsulfanyl, phenylsulfinyl, phenylsulfonyl, S-C_1-C_6alkylsulfinimidoyl, S-C_3-C_6cycloalkylsulfinimidoyl, S-C_2-C_6alkenylsulfinimidoyl, S-C_2-C_6alkinylsulfinimidoyl, S-phenylsulfinimidoyl, S-C_1-C_6alkylsulfonimidoyl, S-C_3-C_6cycloalkylsulfonimidoyl, S-C_2-C_6alkenylsulfonimidoyl, S-C_2-C_6alkinylsulfonimidoyl, S-phenylsulfonimidoyl, NH(C_1-C_6alkyl), N(C_1-C_6alkyl)$_2$, -NHCO-C_1-C_6alkyl, -N(C_1-C_6alkyl)CO-C_1-C_6alkyl, -N(C_3-C_6cycloalkyl)CO-C_1-C_6alkyl, NHCO-C_3-C_6cycloalkyl, N(C_1-C_6alkyl)CO-(C_3-C_6cycloalkyl), N(C_3-C_6cycloalkyl)CO-(C_3-C_6cycloalkyl), N(C_1-C_6alkyl)CO-phenyl, N(C_3-C_6cycloalkyl)CO-phenyl, NHCO-phenyl, N(CO-C_1-C_6alkyl)$_2$, -N(CO-C_3-C_6cycloalkyl)$_2$, N(CO-phenyl)$_2$, N(CO-C_3-C_6cycloalkyl)(CO-C_1-C_6alkyl), N(CO-C_3-C_6cycloalkyl)(CO-phenyl), N(CO-C_1-C_6alkyl)(CO-phenyl), CONH(C_1-C_6alkyl), CON(C_1-C_6alkyl)$_2$, CONH(C_3-C_6cycloalkyl), CON(C_1-C_6alkyl)(C_3-C_6cycloalkyl), CON(C_3-C_6cycloalkyl)$_2$, CONH-SO_2-C_1-C_6alkyl, -CONH-SO_2-phenyl, -CONH-SO_2-(C_3-C_6cycloalkyl), -CON(C_1-C_6alkyl)-SO_2-C_1-C_6alkyl, -CON(C_1-C_6alkyl)-SO_2-phenyl, -CON(C_1-C_6alkyl)-SO_2-(C_3-C_6cycloalkyl), -CONH-phenyl, -CON(C_1-C_6alkyl)phenyl, -CON(C_3-C_6cycloalkyl)phenyl, N(SO_2C_1-C_6alkyl)$_2$, N(SO_2C_1-C_6haloalkyl)$_2$, N(SO_2C_3-C_6cycloalkyl)$_2$, N(SO_2C_1-C_6alkyl)SO_2-phenyl, N(SO_2C_3-C_6cycloalkyl)SO_2-phenyl, NHSO_2-C_1-C_6alkyl, -NHSO_2-C_1-C_6haloalkyl, N(C_1-C_6alkyl)SO_2-C_1-C_6alkyl, N(C_3-C_6cycloalkyl)SO_2-C_1-C_6alkyl, NHSO_2-phenyl, N(C_1-C_6alkyl)SO_2-phenyl, N(C_3-C_6cycloalkyl)SO_2-phenyl, NHSO_2-C_3-C_6cycloalkyl, N(C_1-C_6alkyl)SO_2-(C_3-C_6cycloalkyl), N(C_3-C_6cycloalkyl)SO_2-(C_3-C_6cycloalkyl), -SO_2NH(C_1-C_6alkyl), SO_2N(C_1-C_6alkyl)$_2$, SO_2N(C_1-C_6alkyl)(C_3-C_6cycloalkyl), -SO_2NH(C_3-C_6cycloalkyl), SO_2N(C_3-C_6cycloalkyl)$_2$, -SO_2NH(phenyl), SO_2N(C_1-C_6alkyl)(phenyl), SO_2N(C_1-C_4cycloalkyl)(phenyl), NHCS-C_1-C_6alkyl, N(C_1-C_6alkyl)CS-C_1-C_6alkyl, N(C_3-C_6cycloalkyl)CS-C_1-C_6alkyl, NHCS-C_3-C_6cycloalkyl, N(C_1-C_6alkyl)CS-(C_3-C_6cycloalkyl), N(C_3-C_6cycloalkyl)CS-(C_3-C_6cycloalkyl), N(C_1-C_6alkyl)CS-phenyl, N(C_3-C_6cycloalkyl)CS-phenyl, NHCS-phenyl, CSNH(C_1-C_6alkyl), CSN(C_1-C_6alkyl)$_2$, CSNH(C_3-C_6cycloalkyl), CSN(C_1-

~~C_6alkyl)(C_3-C_6cycloalkyl), CSN(C_3-C_6cycloalkyl)$_2$, CSNH phenyl, CSN(C_1-C_6alkyl)phenyl, CSN(C_3-C_6cycloalkyl)phenyl, C(=NOC_1-C_6alkyl)H, C(=NOC_1-C_6alkyl) C_1-C_6alkyl, phenyl and 5- to 6-membered heteroaryl;~~

~~R^5 is hydrogen, halogen, CN, or in each case optionally substituted C_1-C_6alkyl, C_3-C_6cycloalkyl, C_1-C_6alkoxy, C(O)C_1-C_6alkoxy, CH(C_1-C_6alkoxy)$_2$, CO_2C_1-C_6alkyl, CONH(C_1-C_6alkyl), CON(C_1-C_6alkyl)$_2$, NHCO-C_1-C_6alkyl, N(C_1-C_6alkyl)CO-C_1-C_6alkyl, C(=NOC_1-C_6alkyl)H, or C(=NOC_1-C_6alkyl)-C_1-C_6alkyl.~~

~~2~~1. A ~~C~~compound ~~according to Claim 1~~of formula (I),



(I),

in which

X is O or S;

Q^1 and Q^2 are independently CR^5 or N, provided at least one of Q^1 and Q^2 is N;

Y is a direct bond or CH_2;

R^1 is hydrogen; C_1-C_6alkyl optionally substituted with one substituent selected from -CN, -$CONH_2$, -COOH, -NO_2 and -$Si(CH_3)_3$; C_1-C_6haloalkyl; C_2-C_6alkenyl; C_2-C_6haloalkenyl; C_2-C_6alkynyl; C_2-C_6haloalkynyl; C_3-C_4cycloalkyl-C_1-C_2alkyl- wherein the C_3-C_4cycloalkyl is optionally substituted with one or two halogen atoms; oxetan-3-yl-CH_2- or benzyl optionally substituted with halogen atoms or C_1-C_3haloalkyl;

R^2 is phenyl, pyridine, pyrimidine, pyrazine or pyridazine, wherein the phenyl, pyridine, pyrimidine, pyrazine or pyridazine is optionally substituted with one to three substituents, provided the substituent(s) are not on either carbon adjacent to the carbon bonded to the C=X-group, each independently selected from the group consisting of C_1-C_3alkyl, C_1-C_3haloalkyl, C_1-C_3haloalkylthio, C_1-C_3alkoxy, C_1-C_3haloalkoxy, halogen, -NO_2, -SF_5, -CN, -$CONH_2$, -COOH and -$C(S)NH_2$;

R^3 is C_1-C_3alkyl or C_1-C_3haloalkyl;

R^4 is pyridine, pyrimidine, pyrazine or pyridazine, wherein the pyridine, pyrimidine, pyrazine or pyridazine is substituted with two to three substituents independently selected from the group consisting of

halogen, hydroxy, -CN, -COOH, $-CONH_2$, $-CSNH_2$, $-NO_2$, $-NH_2$, C_1-C_6alkyl, optionally substituted C_3-C_6cycloalkyl, C_1-C_3haloalkyl, C_1-C_4alkoxy, C_1-C_3haloalkoxy, C_1-C_6alkylthio, C_1-C_6alkylsulfinyl, C_1-C_6alkylsulfonyl, C_3-C_6cycloalkylsulfanyl, C_3-C_6cycloalkylsulfinyl, C_3-C_6cycloalkylsulfonyl, C_1-C_3haloalkylthio, C_1-C_3haloalkylsulfinyl, C_1-C_3haloalkylsulfonyl, -NH(C_1-C_4alkyl), -N(C_1-C_4alkyl)$_2$, -NHCO-C_1-C_4alkyl, -N(C_1-C_4alkyl)CO-C_1-C_4alkyl, -CO_2C_1-C_4alkyl, -CONH(C_1-C_4alkyl), -CON(C_1-C_4alkyl)$_2$, -C(=NOC_1-C_4alkyl)H, -C(=NOC_1-C_4alkyl)-C_1-C_4alkyl;

and phenyl and 5- to 6-membered heteroaryl, wherein the phenyl or 5- to 6-membered heteroaryl is optionally substituted with one to two substituents, each independently selected from the group consisting of halogen, -CN, C_1-C_6alkyl, C_1-C_3haloalkyl and C_1-C_4alkoxy;

or

R^4 is pyridine, pyrimidine, pyrazine or pyridazine, wherein the pyridine, pyrimidine, pyrazine or pyridazine is substituted with a total of one to three substiuent(s), provided at least one and up to three substituent(s) are independently selected from group A consisting of

-CN, -COOH, $-CONH_2$, $-CSNH_2$, $-NO_2$, $-NH_2$, C_5-C_6cycloalkyl, substituted C_3-C_4cycloalkyl, C_1-C_4haloalkoxy, C_1-C_6alkylthio, C_1-C_6alkylsulfinyl, C_1-C_6alkylsulfonyl, C_3-C_6cycloalkylsulfanyl, C_3-C_6cycloalkylsulfinyl, C_3-C_6cycloalkylsulfonyl, C_1-C_3haloalkylthio, C_1-C_3haloalkylsulfinyl, C_1-C_3haloalkylsulfonyl, -NH(C_1-C_4alkyl), -N(C_1-C_4alkyl)$_2$, -NHCO-C_1-C_4alkyl, -NHCO-C_1-C_4haloalkyl, -NHCO-C_1-C_4cyanoalkyl, -NHCO-C_3-C_6cycloalkyl, wherein the cycloalkyl is optionally substituted with one to three substituents selected from the group consisting of cyano, halogen, C_1-C_3alkyl and C_2-C_4haloalkenyl; -NHCO-C_1-C_4alkyl-C_3-C_6cycloalkyl, -NHCO-phenyl, wherein the phenyl is optionally substituted with one to two substituents selected from the group consisting of halogen, CN, C_1-C_6alkyl and C_1-C_3haloalkyl; -N(SO_2C_1-C_3alkyl)$_2$, -NH(SO_2C_1-C_3alkyl), -N(C_1-C_4alkyl)CO-C_1-C_4alkyl, -$NHSO_2C_1$-

C_4haloalkyl, -NHCS-C_1-C_4alkyl, -NHCS-C_3-C_5cycloalkyl, -NHCS-C_1-C_4alkyl-C_3-C_5cycloalkyl, -CO_2C_1-C_4alkyl, -CONH(C_1-C_5alkyl), wherein the alkyl is optionally substituted with one to three substituents selected from the group consisting of cyano and halogen; -CON(C_1-C_4alkyl)$_2$, -CONH-C_3-C_5cycloalkyl, wherein the cycloalkyl is optionally substituted with one to three substituents selected from the group consisting of cyano and halogen; -CON(C_1-C_5alkyl)(C_3-C_5cycloalkyl), CONH-phenyl, wherein the phenyl is optionally substituted with one to three substituents selected from the group consisting of cyano and halogen; -CONHSO$_2$-C_1-C_4alkyl, -C(=NOC_1-C_4alkyl)H, -C(=NOC_1-C_4alkyl)-C_1-C_4alkyl;

and phenyl and 5- to 6-membered heteroaryl, wherein the phenyl or 5- to 6-membered heteroaryl is optionally substituted with one to two substituents, each independently selected from the group consisting of halogen, -CN, C_1-C_6alkyl, C_1-C_3haloalkyl and C_1-C_4alkoxy;

the other one to two optional substituent(s) are each independently selected from group B consisting of

halogen, hydroxy, -CN, -COOH, -CONH$_2$, -NO$_2$, -NH$_2$, C_1-C_6alkyl, C_3-C_6cycloalkyl, C_1-C_3haloalkyl, C_1-C_4alkoxy, C_1-C_3haloalkoxy, C_1-C_6alkylthio, C_1-C_6alkylsulfinyl, C_1-C_6alkylsulfonyl, C_3-C_6cycloalkylsulfanyl, C_3-C_6cycloalkylsulfinyl, C_3-C_6cycloalkylsulfonyl, C_1-C_3haloalkylthio, C_1-C_3haloalkylsulfinyl, C_1-C_3haloalkylsulfonyl, -NH(C_1-C_4alkyl), -N(C_1-C_4alkyl)$_2$, -NHCO-C_1-C_4alkyl, -N(C_1-C_4alkyl)CO-C_1-C_4alkyl, -CO_2C_1-C_4alkyl, -CONH(C_1-C_4alkyl), -CON(C_1-C_4alkyl)$_2$, -C(=NOC_1-C_4alkyl)H, -C(=NOC_1-C_4alkyl)-C_1-C_4alkyl;

and phenyl and 5- to 6-membered heteroaryl, wherein the phenyl or 5- to 6-membered heteroaryl is optionally substituted with one to two substituents, each independently selected from the group consisting of halogen, -CN, C_1-C_6alkyl, C_1-C_3haloalkyl and C_1-C_4alkoxy;

or

R^4 is a 5-membered heteroaryl optionally substituted with one to three substituents independently selected from the group consisting of

halogen, hydroxy, -CN, -COOH, -$CONH_2$, -$CSNH_2$, -NO_2, -NH_2, C_1-C_6alkyl, C_3-C_6cycloalkyl, C_1-C_3haloalkyl, C_1-C_4alkoxy, C_1-C_3haloalkoxy, C_1-C_6alkylthio, C_1-C_6alkylsulfinyl, C_1-C_6alkylsulfonyl, C_3-C_6cycloalkylsulfanyl, C_3-C_6cycloalkylsulfinyl, C_3-C_6cycloalkylsulfonyl, C_1-C_3haloalkylthio, C_1-C_3haloalkylsulfinyl, C_1-C_3haloalkylsulfonyl, -NH(C_1-C_4alkyl), -N(C_1-C_4alkyl)$_2$, -NHCO-C_1-C_4alkyl, -N(C_1-C_4alkyl)CO-C_1-C_4alkyl, -CO_2C_1-C_4alkyl, -CONH(C_1-C_4alkyl), -CON(C_1-C_4alkyl)$_2$, -C(=NOC_1-C_4alkyl)H, -C(=NOC_1-C_4alkyl)-C_1-C_4alkyl;

and phenyl and 5- to 6-membered heteroaryl, wherein the phenyl or 5- to 6-membered heteroaryl is optionally substituted with one to two substituents, each independently selected from the group consisting of halogen, -CN, C_1-C_6alkyl, C_1-C_3haloalkyl and C_1-C_4alkoxy;

or

R^4 is a heterocyclic ring which is selected from the group consisting of 4- to 10-membered saturated or partially unsaturated heterocyclyl, 9-membered heteroaryl and 10-membered heteroaryl, each of which is optionally substituted by one to three substituents independently selected from the group consisting of

halogen, =O (oxo), hydroxy, -CN, -COOH, -$CONH_2$, -$CSNH_2$, -NO_2, -SF_5, -NH_2, C_1-C_6alkyl, C_3-C_6cycloalkyl, C_3-C_6cycloalkyl-C_1-C_6alkyl, C_1-C_3haloalkyl, C_1-C_4alkoxy, C_1-C_3haloalkoxy, C_1-C_6alkylthio, C_1-C_6alkylsulfinyl, C_1-C_6alkylsulfonyl, C_3-C_6cycloalkylsulfanyl, C_3-C_6cycloalkylsulfinyl, C_3-C_6cycloalkylsulfonyl, C_1-C_3haloalkylthio, C_1-C_3haloalkylsulfinyl, C_1-C_3haloalkylsulfonyl, -NH(C_1-C_4alkyl), -N(C_1-C_4alkyl)$_2$, -NHCO-C_1-C_4alkyl, -N(C_1-C_4alkyl)CO-C_1-C_4alkyl, -CO_2C_1-C_4alkyl, -CONH(C_1-C_4alkyl), -CON(C_1-C_4alkyl)$_2$, -C(=NOC_1-C_4alkyl)H, -C(=NOC_1-C_4alkyl)-C_1-C_4alkyl;

and phenyl and 5- to 6-membered heteroaryl, wherein the phenyl or 5- to 6-membered heteroaryl is optionally substituted with one to two substituents, each independently selected from the group consisting of halogen, -CN, C_1-C_6alkyl, C_1-C_3haloalkyl and C_1-C_4alkoxy;

R^5 is hydrogen, halogen, -CN, C_1-C_3alkyl, C_1-C_3haloalkyl, C_3-C_4cycloalkyl, C_1-C_3alkoxy, C_1-C_3haloalkoxy, -C(O)C_1-C_3alkoxyC, -CH(C_1-C_3alkoxy)$_2$, -CO_2C_1-C_4alkyl, -CONH(C_1-C_4alkyl), -CON(C_1-C_4alkyl)$_2$, -NHCO-C_1-C_4alkyl, -N(C_1-C_4alkyl)CO-C_1-C_4alkyl, -C(=NOC_1-C_4alkyl)H, or -C(=NOC_1-C_4alkyl)-C_1-C_4alkyl.

~~3~~2. The ~~Compound~~ compound according to Claim 1 ~~or 2~~, in which

X is O or S;

Q^1 and Q^2 are independently CR^5 or N, provided at least one of Q^1 and Q^2 is N;

Y is a direct bond or CH_2;

R^1 is hydrogen; C_1-C_3alkyl optionally substituted with one substituent selected from -CN, -$CONH_2$, -COOH, -NO_2 and -$Si(CH_3)_3$; C_1-C_3haloalkyl; C_2-C_4alkenyl; C_2-C_4haloalkenyl; C_2-C_4alkynyl; C_2-C_4haloalkynyl; C_3-C_4cycloalkyl-C_1-C_2alkyl- wherein the C_3-C_4cycloalkyl is optionally substituted with one or two halogen atoms; oxetan-3-yl-CH_2-; or benzyl optionally substituted with halogen atoms or C_1-C_3haloalkyl;

R^2 is phenyl, pyridine, pyrimidine, pyrazine or pyridazine, wherein the phenyl, pyridine, pyrimidine, pyrazine or pyridazine is optionally substituted with one to three substituents, provided the substituent(s) are not on either carbon adjacent to the carbon bonded to the C=X-group, each independently selected from the group consisting of C_1-C_3alkyl, C_1-C_3haloalkyl, C_1-C_3haloalkylthio, C_1-C_3alkoxy, C_1-C_3haloalkoxy, halogen, -NO_2, -SF_5, -CN, -$CONH_2$, -COOH and -$C(S)NH_2$;

R^3 is C_1-C_3alkyl or C_1-C_3haloalkyl;

R^4 is pyridine, pyrimidine, pyrazine or pyridazine, wherein the pyridine, pyrimidine, pyrazine or pyridazine is substituted with two to three substituents independently selected from the group consisting of

halogen, -CN, C_1-C_6alkyl, C_3-C_6cycloalkyl, C_1-C_3haloalkyl, C_1-C_4alkoxy, C_1-C_3haloalkoxy, C_1-C_3alkylthio, C_1-C_3alkylsulfinyl, C_1-C_3alkylsulfonyl, C_1-C_3haloalkylthio, C_1-C_3haloalkylsulfinyl, C_1-C_3haloalkylsulfonyl, -NHCO-C_1-C_4alkyl, -$CONH(C_1$-C_4alkyl), -$CON(C_1$-C_4alkyl)$_2$, -$C(=NOC_1$-C_4alkyl)H, -$C(=NOC_1$-C_4alkyl)-C_1-C_4alkyl;

and phenyl and 5- to 6-membered heteroaryl, wherein the phenyl or 5- to 6-membered heteroaryl is optionally substituted with one to two substituents, each independently selected from the group consisting of halogen, -CN, C_1-C_6alkyl and C_1-C_3haloalkyl;

or

R^4 is pyridine, pyrimidine, pyrazine or pyridazine, wherein the pyridine, pyrimidine, pyrazine or pyridazine is substituted with a total of one to three substiuent(s), provided at least one and up to three substituent(s) are independently selected from group A consisting of

-$CONH_2$, -CN, -NO_2, -NH_2, C_5-C_6cycloalkyl, substituted C_3-C_4cycloalkyl, C_1-C_4haloalkoxy, C_1-C_3alkylthio, C_1-C_3alkylsulfinyl, C_1-C_3alkylsulfonyl, C_1-C_3haloalkylthio, C_1-C_3haloalkylsulfinyl, C_1-C_3haloalkylsulfonyl, -NHCO-C_1-C_4alkyl, -NHCO-C_1-C_4haloalkyl, -NHCO-C_1-C_4cyanoalkyl, -NHCO-C_3-C_6cycloalkyl, wherein the cycloalkyl is optionally substituted with one to three substituents selected from the group consisting of cyano, halogen, C_1-C_3alkyl and C_2-C_4haloalkenyl; -NHCO-C_1-C_3alkyl-C_3-C_4cycloalkyl, -NHCO-phenyl, wherein the phenyl is optionally substituted with one to two substituents selected from the group consisting of fluorine and chlorine; -N(SO_2C_1-C_3alkyl)$_2$, -NH(SO_2C_1-C_3alkyl), -NHSO_2C_1-C_4haloalkyl, -NHCS-C_1-C_4alkyl, -NHCS-C_3-C_5cycloalkyl, -NHCS-C_1-C_4alkyl-C_3-C_5cycloalkyl, -CO_2C_1-C_4alkyl, -CONH(C_1-C_5alkyl), wherein the alkyl is optionally substituted with one to three substituents selected from the group consisting of cyano and halogen; -CON(C_1-C_4alkyl)$_2$, -CONH-C_3-C_5cycloalkyl, wherein the cycloalkyl is optionally substituted with one to three substituents selected from the group consisting of cyano and halogen; -CON(C_1-C_5alkyl)(C_3-C_5cycloalkyl), CONH-phenyl, wherein the phenyl is optionally substituted with one to three substituents selected from the group consisting of cyano and halogen; -CONHSO_2-C_1-C_4alkyl -C(=NOC_1-C_4alkyl)H, -C(=NOC_1-C_4alkyl)-C_1-C_4alkyl;

and phenyl and 5- to 6-membered heteroaryl, wherein the phenyl or 5- to 6-membered heteroaryl is optionally substituted with one to two substituents, each independently selected from the group consisting of halogen, -CN, C_1-C_6alkyl and C_1-C_3haloalkyl;

the other one to two optional substituent(s) are each independently selected from group B consisting of

halogen, -CN, C_1-C_6alkyl, C_3-C_6cycloalkyl, C_1-C_3haloalkyl, C_1-C_4alkoxy, C_1-C_3haloalkoxy, C_1-C_3alkylthio, C_1-C_3alkylsulfinyl, C_1-C_3alkylsulfonyl, C_1-C_3haloalkylthio, C_1-C_3haloalkylsulfinyl, C_1-C_3haloalkylsulfonyl, -NHCO-C_1-C_4alkyl, -CONH(C_1-C_4alkyl), -CON(C_1-C_4alkyl)$_2$, -C(=NOC_1-C_4alkyl)H, -C(=NOC_1-C_4alkyl)-C_1-C_4alkyl;

and phenyl and 5- to 6-membered heteroaryl, wherein the phenyl or 5- to 6-membered heteroaryl is optionally substituted with one to two substituents, each independently selected from the group consisting of halogen, -CN, C_1-C_6alkyl and C_1-C_3haloalkyl;

or

R^4 is a 5-membered heteroaryl optionally substituted with one to three substituents independently selected from the group consisting of

halogen, -CN, C_1-C_6alkyl, C_3-C_6cycloalkyl, C_1-C_3haloalkyl, C_1-C_4alkoxy, C_1-C_3haloalkoxy, C_1-C_3alkylthio, C_1-C_3alkylsulfinyl, C_1-C_3alkylsulfonyl, C_1-C_3haloalkylthio, C_1-C_3haloalkylsulfinyl, C_1-C_3haloalkylsulfonyl, -NHCO-C_1-C_4alkyl, -CONH(C_1-C_4alkyl), -CON(C_1-C_4alkyl)$_2$, -C(=NOC_1-C_4alkyl)H, -C(=NOC_1-C_4alkyl)-C_1-C_4alkyl;

and phenyl and 5- to 6-membered heteroaryl, wherein the phenyl or 5- to 6-membered heteroaryl is optionally substituted with one to two substituents, each independently selected from the group consisting of halogen, -CN, C_1-C_6alkyl and C_1-C_3haloalkyl

or

R^4 is a heterocyclic ring which is selected from the group consisting of 4- to 10-membered saturated or partially unsaturated heterocyclyl, 9-membered heteroaryl and 10-membered heteroaryl, each of which is optionally substituted by one to three substituents independently selected from the group consisting of

halogen, =O (oxo), -CN, C_1-C_6alkyl, C_3-C_6cycloalkyl, C_1-C_3haloalkyl, C_1-C_3alkoxy, C_1-C_3haloalkoxy, C_1-C_3alkylthio, C_1-C_3alkylsulfinyl, C_1-C_3alkylsulfonyl, C_3-C_4cycloalkylsulfanyl, C_3-C_4cycloalkylsulfinyl, C_3-C_4cycloalkylsulfonyl, C_1-C_3haloalkylthio, C_1-C_3haloalkylsulfinyl, C_1-C_3haloalkylsulfonyl, -NHCO-C_1-C_4alkyl, -N(C_1-C_4alkyl)CO-C_1-C_4alkyl, -CONH(C_1-C_4alkyl), -CON(C_1-C_4alkyl)$_2$, -C(=NOC_1-C_4alkyl)H, -C(=NOC_1-C_4alkyl)-C_1-C_4alkyl;

and phenyl and 5- to 6-membered heteroaryl, wherein the phenyl or 5- to 6-membered heteroaryl is optionally substituted with one to two substituents, each independently selected from the group consisting of halogen, -CN, C_1-C_6alkyl and C_1-C_3haloalkyl;

R^5 is hydrogen, halogen, -CN, C_1-C_3alkyl, C_1-C_3haloalkyl, C_3-C_4cycloalkyl, or C_1-C_3alkoxy.

43. The ~~Compound~~ compound according to claim 1~~any of Claims 1 to 3~~, in which

X is O or S;

Q^1 and Q^2 are independently CR^5 or N, provided at least one of Q^1 and Q^2 is N;

Y is a direct bond or CH_2;

R^1 is hydrogen; C_1-C_3alkyl optionally substituted with -CN, -$Si(CH_3)_3$ or one to three substituents selected from the group consisting of fluorine, chlorine or bromine; C_2-C_4alkenyl; C_2-C_4alkynyl; or C_3-C_4cycloalkyl-C_1-C_2alkyl- wherein the C_3-C_4cycloalkyl is optionally substituted with one to two substituents selected from the group consisting of fluorine, chlorine and bromine;

R^2 is phenyl or pyridine, wherein the phenyl or pyridine is optionally substituted with one to three substituents, provided the substituent(s) are not on either carbon adjacent to the carbon bonded to the C=X group, each independently selected from the group consisting of fluorine, chlorine, bromine, -CN, -NO_2, -SF_5, methyl, difluoromethyl, trifluoromethyl, heptafluoropropyl, methoxy, trifluoromethoxy, difluoromethoxy, difluoromethylthio, and trifluoromethylthio;

R^3 is C_1-C_3alkyl;

R^4 is pyridine, pyrimidine, pyrazine or pyridazine, wherein the pyridine, pyrimidine, pyrazine or pyridazine is substituted with two to three substituents independently selected from the group consisting of

fluorine, chlorine, bromine, iodine, -CN, methyl, cyclopropyl, difluoromethyl, trifluoromethyl, methoxy, trifluoromethoxy, difluoromethoxy, methylthio, methylsulfinyl, methylsulfonyl, difluoromethylthio, difluoromethylsulfinyl, difluoromethylsulfonyl, trifluoromethylthio, trifluoromethylsulfinyl, trifluoromethylsulfonyl and phenyl, wherein the phenyl is optionally substituted with one to two substituents selected from the group consisting of fluorine, chlorine, bromine, -CN, difluoromethyl and trifluoromethyl;

or

R^4 is pyridine, pyrimidine, pyrazine or pyridazine, wherein the pyridine, pyrimidine, pyrazine or pyridazine is substituted with a total of one to three substiuent(s), provided at least one and up to three substituent(s) are independently selected from group A consisting of

-$CONH_2$, -CN, -NO_2, -NH_2, cyclopentyl, cyclohexyl, trifluoromethoxy, difluoromethoxy, 2,2,2-trifluoroethoxy, 2,2,3,3,3-pentafluoropropoxy, 4,4,4-trifluorobutoxy, methylthio, methylsulfinyl, methylsulfonyl, difluoromethylthio, difluoromethylsulfinyl, difluoromethylsulfonyl, trifluoromethylthio, trifluoromethylsulfinyl, trifluoromethylsulfonyl, methoxyiminomethyl, -NHCO-C_1-C_3alkyl, -NHCO-C_1-C_3haloalkyl, -NHCO-C_1-C_3cyanoalkyl, -NHCO-C_3-C_5cycloalkyl, wherein the cycloalkyl is optionally substituted with one to three substituents selected from the group consisting of cyano, fluorine, chlorine, methyl and C_2-C_4haloalkenyl; -NHCO-C_1-C_3alkyl-C_3-C_4cycloalkyl, -NHCO-phenyl, wherein the phenyl is optionally substituted with one to two substituents selected from the group consisting of fluorine and chlorine; -N(SO_2C_1-C_3alkyl)$_2$, -NHSO_2C_1-C_3alkyl, -NHSO_2C_1-C_3haloalkyl, -NHCS-C_1-C_3alkyl, -NHCS-C_3-C_4cycloalkyl, -NHCS-C_1-C_3alkyl- C_3-C_4cycloalkyl, -CONH(C_1-C_5alkyl), wherein the alkyl is optionally substituted with one to three substituents selected from the group consisting of cyano, fluorine and chlorine; -CON(C_1-C_3alkyl)$_2$, -CONH-C_3-C_4cycloalkyl, wherein the cycloalkyl is optionally substituted with one to three substituents selected from the group consisting of cyano, fluorine and chlorine; -CON(C_1-C_3alkyl)(C_3-C_4cycloalkyl), -CONH-phenyl, wherein the phenyl is optionally substituted with one to three substituents selected from the group consisting of cyano, fluorine and chlorine; -CONHSO_2-C_1-C_3alkyl, -CO_2C_1-C_4alkyl;

and phenyl and 5-membered heteroaryl, wherein the phenyl or 5-membered heteroaryl is optionally substituted with one to two substituents selected from the group consisting of fluorine, chlorine, bromine, -CN, difluoromethyl and trifluoromethyl;

the other one to two optional substituents are each independently selected from group B consisting of

fluorine, chlorine, bromine, iodine, -CN, methyl, cyclopropyl, difluoromethyl, trifluoromethyl, methoxy, trifluoromethoxy, difluoromethoxy, methylthio, methylsulfinyl, methylsulfonyl, difluoromethylthio, difluoromethylsulfinyl,

difluoromethylsulfonyl, trifluoromethylthio, trifluoromethylsulfinyl, trifluoromethylsulfonyl and phenyl, wherein the phenyl is optionally substituted with one to two substituents selected from the group consisting of fluorine, chlorine, bromine, -CN, difluoromethyl and trifluoromethyl;

or

R^4 is a 5-membered heteroaryl optionally substituted with one to three substituents independently selected from the group consisting of

fluorine, chlorine, bromine, iodine, -CN, methyl, cyclopropyl, difluoromethyl, trifluoromethyl, methoxy, trifluoromethoxy, difluoromethoxy, methylthio, methylsulfinyl, methylsulfonyl, difluoromethylthio, difluoromethylsulfinyl, difluoromethylsulfonyl, trifluoromethylthio, trifluoromethylsulfinyl, trifluoromethylsulfonyl and phenyl, wherein the phenyl is optionally substituted with one to two substituents selected from the group consisting of fluorine, chlorine, bromine, -CN, difluoromethyl and trifluoromethyl;

or

R^4 is a heterocyclic ring which is selected from the group consisting of 5-membered saturated or partially unsaturated heterocyclyl, 9-membered heteroaryl and 10-membered heteroaryl, each of which is optionally substituted by one to three substituents independently selected from the group consisting of

fluorine, chlorine, bromine, iodine, =O (oxo), -CN, methyl, cyclopropyl, difluoromethyl, trifluoromethyl, methoxy, trifluoromethoxy, difluoromethoxy, methylthio, methylsulfinyl, methylsulfonyl, difluoromethylthio, difluoromethylsulfinyl, difluoromethylsulfonyl, trifluoromethylthio, trifluoromethylsulfinyl, trifluoromethylsulfonyl and phenyl, wherein the phenyl is optionally substituted with one to two substituents selected from the group consisting of fluorine, chlorine, bromine, -CN, difluoromethyl and trifluoromethyl;

R^5 is hydrogen, fluorine, chlorine, bromine, -CN, methyl, ethyl, propyl, iso-propyl, difluoromethyl, trifluoromethyl, cyclopropyl, methoxy, or ethoxy.

~~5~~4. The ~~Compound~~ compound according to claim 1~~any of Claims 1 to 4~~, in which

X is O or S;

Q^1 is N;

Q^2 is CR^5;

Y is a direct bond;

R^1 is hydrogen, ethyl, cyclopropyl-CH_2-, 2-trimethylsilylethyl or 2,2,2-trifluoroethyl;

R^2 3-chloro-5-(trifluoromethyl)phenyl, 3-cyano-5-fluorophenyl, 3-fluoro-5-(trifluoromethyl)phenyl, 3,4,5-trifluorophenyl, 4-chloro-3,5-difluorophenyl, 3-methyl-5-(trifluoromethyl)phenyl, 3-chloro-5-(trifluoromethoxy)phenyl, 3-chloro-5-(trifluoromethylthio)phenyl, 3-bromo-5-chlorophenyl, 3,5-dichlorophenyl, 3-chloro-5-(pentafluoro-λ6-sulfanyl)phenyl, 3,5-bis(trifluoromethyl)phenyl, 5-bromopyridin-3-yl, 5-iodopyridin-3-yl, 5-(trifluoromethyl)pyridin-3-yl, 3-chloro-5-methoxyphenyl, 3-bromo-5-(trifluoromethyl)phenyl, 3-methoxy-5-(trifluoromethyl)phenyl, 3-chloro-5-(difluoromethoxy)phenyl, 3-bromo-5-cyanophenyl, 3-cyano-5-(triflurоromethyl), 3-bromo-5-fluorophenyl, 3-fluoro-5-(trifluoromethylthio)phenyl, 3-chloro-5-nitrophenyl, 5,6-bis(trifluoromethyl)pyridin-3-yl, 5-chloropyridin-3-yl, 3-((1,2,2,2-tetrafluoro-1-(trifluoromethyl)ethylphenyl, 6-chloro-4-(trifluoromethyl)pyridin-2-yl, or 3-chlorophenyl;

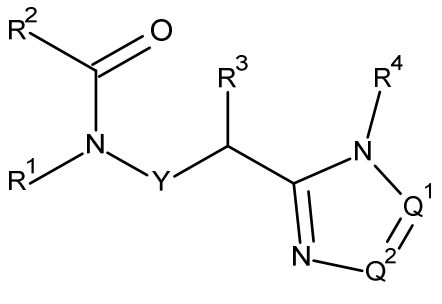
R^3 is methyl or ethyl;

R^4 is 4,6-dimethylpyrimidin-2-yl, 4-methoxy-6-methylpyrimidin-2-yl, 1,3-thiazol-2-yl, quinoxalin-2-yl, [1,2,4]triazolo[1,5-a]pyridin-2-yl, 1-methyl-1H-pyrazol-3-yl, 5-cyanopyridin-2-yl, 5-cyanopyrimidin-2-yl, 5-(trifluoromethoxy)pyrimidin-2-yl, 5-(difluoromethoxy)pyrimidin-2-yl, 5-chloro-3-fluoropyridin-2-yl, 3,5-difluoropyridin-2-yl, 4-cyanopyridin-2-yl, 5-(trifluoromethoxy)pyridin-2-yl, 5-(trifluoromethyl)-1,3,4-thiadiazol-2-yl, 5-chloro-4-(difluoromethyl)-1,3-thiazol-2-yl, 5-(4-fluorophenyl)-1,3,4-thiadiazol-2-yl, 1,1-dioxothiolan-3-yl, 5-(trifluoromethylthio)pyridin-2-yl, 5-(trifluoromethylsulfonyl)pyridin-2-yl, 5-nitropyridin-2-yl, 5-(difluoromethoxy)pyridin-2-yl, 5-aminopyridin-2-yl, 5-(methoxycarbonyl)pyridin-2-yl, 3-(difluoromethyl)-1-methyl-1H-pyrazol-4-yl, 5-(acetylamino)pyridin-2-yl, 5-[(cyclopropylcarbonyl)amino]pyridin-2-yl, 4-(4-chlorophenyl)-1,3-thiazol-2-yl, 5-[(4-fluorobenzoyl)amino]pyridin-2-yl, 5-[bis(methylsulfonyl)amino]pyridin-2-yl, 5-(methylcarbamoyl)pyridin-2-yl, 5-(2,2,2-trifluoroethoxy)pyridin-2-yl, 4-(2-fluorophenyl)-1,3-thiazol-2-yl, 1-methyl-3-(trifluoromethyl)-1H-pyrazol-4-yl, 5-[3-

(trifluoromethyl)-1H-pyrazol-1-yl]pyridin-2-yl, 4-(3-chlorophenyl)-1,3-thiazol-2-yl, 4-(4-fluorophenyl)-1,3-thiazol-2-yl, 5-(methylsulfonamido)pyridin-2-yl, 6-cyanopyridin-2-yl, 1,3-benzoxazol-2-yl, 6-(2,2,2-trifluoroethoxy)pyridin-2-yl, 5-(2,2,3,3,3-pentafluoropropoxy)pyridin-2-yl, N-cyclopropyl-pyridin-2-yl-5-carboxamide, 5-methylsulfonylpyridin-2-yl, 6-methylsulfonylpyridin-2-yl, 5-(methoxyiminomethyl)pyridin-2-yl, 5-((2,2,2-trifluoroacetyl)amino)pyridin-2-yl, 5-((2-cyanoacetyl)amino)pyridin-2-yl, 5-pyrazolylpyridin-2-yl, 4,5-dihydrothiazol-2-yl, 5-((1-cyanocyclopropylcarbonyl)amino)pyridin-2-yl, N-(2,2,2-trifluoroethyl)pyridin-2-yl-5-carboxamide, 5-bromothiazol-2-yl, 4-(trifluoromethyl)thiazol-2-yl, 5-(trifluoromethyl)thiazol-2-yl, 5-imidazolyl-pyridin-2-yl, 5-(1,2,4-triazolyl)pyridin-2-yl, 5-chlorothiazol-2-yl, 5-(trifluoromethylsulfonylamino)pyridin-2-yl, 5-((cyclopropylethylthioyl)amino)pyridin-2-yl, 5-(cyclopropylcarbothioylamino)pyridin-2-yl, 5-(2-methylpropylthioylamino)pyridin-2-yl, pyridin-2-yl-5-carboxamide, 5-((1-chlorocyclopropylcarbonyl)amino)pyridin-2-yl, N-(4-fluorophenyl)pyridin-2-yl-5-carboxamide, N-cyclopropyl-N-methyl-pyridin-2-yl-5-carboxamide, N-methylsulfonyl-pyridin-2-yl-5-carboxamide, N-(1-cyanocyclopropyl)pyridin-2-yl-5-carboxamide, 5-iodothiazol-2-yl, 4-(2,4-difluorophenyl)thiazol-2-yl, N,N-dimethyl-pyridin-2-yl-5-carboxamide, N,N-diethyl-pyridin-2-yl-5-carboxamide, N-isobutyl-pyridin-2-yl-5-carboxamide, 5-((2-cyclopropylacetyl)amino)pyridin-2-yl, 5-((2,2-difluorocyclopropylcarbonyl)amino)pyridin-2-yl, 5-((3,3-((Z)-2-chloro-3,3,3-trifluoro-prop-1-enyl)-2,2-dimethyl-cyclopropylcarbonyl)amino)pyridin-2-yl, 5-(propanoylamino)pyridin-2-yl, 5-((3-chlorobenzoyl)amino)pyridin-2-yl, 5-(4,4,4-trifluorobutoxy)pyridin-2-yl, N-ethyl-pyridin-2-yl-5-carboxamide, N-(1,2-dimethylpropyl)pyridin-2-yl-5-carboxamide, 5-((2-chlorobenzoyl)amino)pyridin-2-yl, N-cyanomethyl-pyridin-2-yl-5-carboxamide, N-(2-chlorophenyl)-pyridin-2-yl-5-carboxamide, N-(4-chlorophenyl)-pyridin-2-yl-5-carboxamide, N-(3-chlorophenyl)-pyridin-2-yl-5-carboxamide, or 4-pyrazol-1-yl-pyridin-2-yl;

R^5 is hydrogen, methyl, propyl or trifluoromethyl.

~~6~~5. The ~~Compound~~ compound according to claim 1~~any of Claims 1 to 5~~, comprising ~~characterized in that it has~~ a structure according to formula (I')



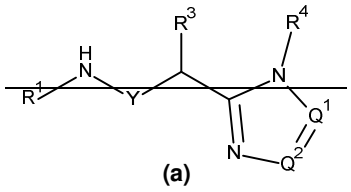
(I')~~,~~

~~in which the structural elements Y, Q^1, Q^2, R^1, R^2, R^3 R^4 and R^5 have the meanings given in Claim 1 or the meanings given in Claim 2 or the meanings given in Claim 3 or the meanings given in Claim 4 or the meanings given in Claim 5.~~

~~7~~6. The ~~C~~ccompound according to claim 1~~any of Claims 1 to 6~~, in which Q^1 represents N or CR^5 and Q^2 represents N~~ and all further structural elements Y, R^1, R^2, R^3 R^4 and R^5 have the meanings given in Claim 1 or the meanings given in Claim 2 or the meanings given in Claim 3 or the meanings given in Claim 4 or the meanings given in Claim 5~~.

~~8~~7. The ~~Compound~~ compound according to claim 1~~any of Claims 1 to 6~~, in Q^1 represents N and Q^2 represents CR^5~~ and all further structural elements Y, R^1, R^2, R^3 R^4 and R^5 have the meanings given in Claim 1 or the meanings given in Claim 2 or the meanings given in Claim 3 or the meanings given in Claim 4 or the meanings given in Claim 5~~.

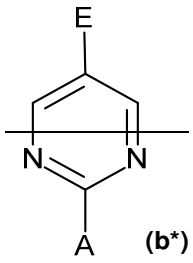
~~9. Compound of the formula (**a**)~~



(a)

~~in which the structural elements Y, R^1, R^2 and R^3 have the meanings given in Claim 1 or the meanings given in Claim 2 or the meanings given in Claim 3 or the meanings given in Claim 4 or the meanings given in Claim 5 and wherein the compound of formula (a) is not N-{1-[1-(2,3-dihydro-1,4-benzodioxin-6-yl)-1H-tetrazol-5-yl]propyl}prop-2-yn-1-amine.~~

~~10. Compound of the formula (**b***)~~



(b*)

~~in which~~

~~E is trifluoromethoxy or difluoromethoxy;~~

~~A is methylsulfonyl or hydrazinyl;~~

~~and wherein the compound of formula (**b***) is not 5-(difluoromethoxy)-2-(methylsulfonyl)pyrimidine.~~

~~11. Compound 5-(difluoromethoxy)-2-hydrazinopyridine and salts thereof.~~

~~12~~8. A ~~Formulation~~formulation, ~~especially~~ optionally an agrochemical formulation, comprising at least one compound of the formula (I) according to claim 1~~any of Claims 1 to 8~~.

~~13~~9. The ~~Formulation~~ formulation according to Claim ~~12~~8, further comprising at least one extender and/or at least one surface-active substance.

~~14~~10. The ~~Formulation~~ formulation according to Claim 8~~12 or 13~~, ~~characterized in that~~wherein the compound of ~~the~~ formula (I) is in a mixture with at least one further active compound.

~~15. Method for controlling pests, especially animal pests, characterized in that a compound of the formula (I) according to any of Claims 1 to 8 or a formulation according to any of Claims 12 to 14 is allowed to act on the pests and/or their habitat.~~

~~16. Method according to Claim 15, characterized in that the pest is an animal pest and comprises an insect, an arachnid or a nematode, or in that the pest is an insect, an arachnid or a nematode.~~

~~17~~11. ~~Use of~~A product comprising a compound of ~~the~~ formula (I) according to claim 1~~any of Claims 1 to 8~~ or of a formulation ~~according to any of Claims 12 to 14~~thereof for controlling one or more animal pests.

~~18~~12. ~~Use~~ The product according to Claim ~~17~~11, ~~characterized in that~~wherein the animal pest comprises an insect, an arachnid or a nematode, or ~~in that~~ the animal pest is an insect, an arachnid or a nematode.

~~19~~13. ~~Use~~ A product according to Claim ~~17 or 18~~11 in crop protection.

~~20~~14. ~~Use~~ A product according to Claim ~~17 or 18~~11 in the field of animal health.

~~21. Method for protecting seed or a germinating plant from pests, especially animal pests, comprising a method step in which the seed is contacted with a compound of the formula (I) according to any of Claims 1 to 8 or with a formulation according to any of Claims 12 to 14.~~

~~22. Seed obtained by a method according to Claim 21.~~

15. The compound according to claim 1,

wherein

R^4 is pyridine, pyrimidine, pyrazine or pyridazine, wherein the pyridine, pyrimidine, pyrazine or pyridazine is substituted with a total of one to three substituent(s), provided at least one and up to three substituent(s) are independently selected from group A consisting of

-CN, -COOH, -$CONH_2$, -$CSNH_2$, -NO_2, -NH_2, substituted C_3-C_4cycloalkyl, C_1-C_4haloalkoxy, C_1-C_6alkylthio, C_1-C_6alkylsulfinyl, C_1-C_6alkylsulfonyl, C_3-C_6cycloalkylsulfanyl, C_3-C_6cycloalkylsulfinyl, C_3-C_6cycloalkylsulfonyl, C_1-C_3haloalkylthio, C_1-C_3haloalkylsulfinyl, C_1-C_3haloalkylsulfonyl, -NH(C_1-C_4alkyl), -N(C_1-C_4alkyl)$_2$, -NHCO-C_1-C_4alkyl, -NHCO-C_1-C_4haloalkyl, -NHCO-C_1-C_4cyanoalkyl, -NHCO-C_3-C_6cycloalkyl, wherein the cycloalkyl is optionally substituted with one to three substituents selected from the group consisting of cyano, halogen, C_1-C_3alkyl and C_2-C_4haloalkenyl; -NHCO-C_1-C_4alkyl-C_3-C_6cycloalkyl, -NHCO-phenyl, wherein the phenyl is optionally substituted with one to two substituents selected from the group consisting of halogen, CN, C_1-C_6alkyl and C_1-C_3haloalkyl; -N(SO_2C_1-C_3alkyl)$_2$, -NH(SO_2C_1-C_3alkyl), -N(C_1-C_4alkyl)CO-C_1-C_4alkyl, -$NHSO_2C_1$-C_4haloalkyl, -NHCS-C_1-C_4alkyl, -NHCS-C_3-C_5cycloalkyl, -NHCS-C_1-C_4alkyl-C_3-C_5cycloalkyl, -CO_2C_1-C_4alkyl, -CONH(C_1-C_5alkyl), wherein the alkyl is optionally substituted with one to three substituents selected from the group consisting of cyano and halogen; -CON(C_1-C_4alkyl)$_2$, -CONH-C_3-C_5cycloalkyl, wherein the cycloalkyl is optionally substituted with one

to three substituents selected from the group consisting of cyano and halogen; -CON(C_1-C_5alkyl)(C_3-C_5cycloalkyl), CONH-phenyl, wherein the phenyl is optionally substituted with one to three substituents selected from the group consisting of cyano and halogen; -CONHSO$_2$-C_1-C_4alkyl, -C(=NOC_1-C_4alkyl)H, -C(=NOC_1-C_4alkyl)-C_1-C_4alkyl;

and phenyl and 5- to 6-membered heteroaryl, wherein the phenyl or 5- to 6-membered heteroaryl is optionally substituted with one to two substituents, each independently selected from the group consisting of halogen, -CN, C_1-C_6alkyl, C_1-C_3haloalkyl and C_1-C_4alkoxy;

the other one to two optional substituent(s) are each independently selected from group B consisting of

halogen, hydroxy, -CN, -COOH, -CONH$_2$, -NO$_2$, -NH$_2$, C_1-C_6alkyl, C_3-C_6cycloalkyl, C_1-C_3haloalkyl, C_1-C_4alkoxy, C_1-C_3haloalkoxy, C_1-C_6alkylthio, C_1-C_6alkylsulfinyl, C_1-C_6alkylsulfonyl, C_3-C_6cycloalkylsulfanyl, C_3-C_6cycloalkylsulfinyl, C_3-C_6cycloalkylsulfonyl, C_1-C_3haloalkylthio, C_1-C_3haloalkylsulfinyl, C_1-C_3haloalkylsulfonyl, -NH(C_1-C_4alkyl), -N(C_1-C_4alkyl)$_2$, -NHCO-C_1-C_4alkyl, -N(C_1-C_4alkyl)CO-C_1-C_4alkyl, -CO$_2$$C_1$-$C_4$alkyl, -CONH($C_1$-$C_4$alkyl), -CON($C_1$-$C_4$alkyl)$_2$, -C(=NO$C_1$-$C_4$alkyl)H, -C(=NO$C_1$-$C_4$alkyl)-$C_1$-$C_4$alkyl;

and phenyl and 5- to 6-membered heteroaryl, wherein the phenyl or 5- to 6-membered heteroaryl is optionally substituted with one to two substituents, each independently selected from the group consisting of halogen, -CN, C_1-C_6alkyl, C_1-C_3haloalkyl and C_1-C_4alkoxy.

16. The compound according to claim 2, wherein

R4 is pyridine, pyrimidine, pyrazine or pyridazine, wherein the pyridine, pyrimidine, pyrazine or pyridazine is substituted with a total of one to three substituent(s), provided at least one and up to three substituent(s) are independently selected from group A consisting of

-CONH$_2$, -CN, -NO$_2$, -NH$_2$, substituted C_3-C_4cycloalkyl, C_1-C_4haloalkoxy, C_1-C_3alkylthio, C_1-C_3alkylsulfinyl, C_1-C_3alkylsulfonyl, C_1-C_3haloalkylthio, C_1-C_3haloalkylsulfinyl, C_1-C_3haloalkylsulfonyl, -NHCO-C_1-C_4alkyl, -NHCO-C_1-C_4haloalkyl, -NHCO-C_1-C_4cyanoalkyl, -NHCO-C_3-C_6cycloalkyl, wherein the

cycloalkyl is optionally substituted with one to three substituents selected from the group consisting of cyano, halogen, C_1-C_3alkyl and C_2-C_4haloalkenyl; -NHCO-C_1-C_3alkyl-C_3-C_4cycloalkyl, -NHCO-phenyl, wherein the phenyl is optionally substituted with one to two substituents selected from the group consisting of fluorine and chlorine; -N(SO_2C_1-C_3alkyl)$_2$, -NH(SO_2C_1-C_3alkyl), -NHSO_2C_1-C_4haloalkyl, -NHCS-C_1-C_4alkyl, -NHCS-C_3-C_5cycloalkyl, -NHCS-C_1-C_4alkyl-C_3-C_5cycloalkyl, -CO_2C_1-C_4alkyl, -CONH(C_1-C_5alkyl), wherein the alkyl is optionally substituted with one to three substituents selected from the group consisting of cyano and halogen; -CON(C_1-C_4alkyl)$_2$, -CONH-C_3-C_5cycloalkyl, wherein the cycloalkyl is optionally substituted with one to three substituents selected from the group consisting of cyano and halogen; -CON(C_1-C_5alkyl)(C_3-C_5cycloalkyl), CONH-phenyl, wherein the phenyl is optionally substituted with one to three substituents selected from the group consisting of cyano and halogen; -CONHSO_2-C_1-C_4alkyl -C(=NOC_1-C_4alkyl)H, -C(=NOC_1-C_4alkyl)-C_1-C_4alkyl;

and phenyl and 5- to 6-membered heteroaryl, wherein the phenyl or 5- to 6-membered heteroaryl is optionally substituted with one to two substituents, each independently selected from the group consisting of halogen, -CN, C_1-C_6alkyl and C_1-C_3haloalkyl;

the other one to two optional substituent(s) are each independently selected from group B consisting of

halogen, -CN, C_1-C_6alkyl, C_3-C_6cycloalkyl, C_1-C_3haloalkyl, C_1-C_4alkoxy, C_1-C_3haloalkoxy, C_1-C_3alkylthio, C_1-C_3alkylsulfinyl, C_1-C_3alkylsulfonyl, C_1-C_3haloalkylthio, C_1-C_3haloalkylsulfinyl, C_1-C_3haloalkylsulfonyl, -NHCO-C_1-C_4alkyl, -CONH(C_1-C_4alkyl), -CON(C_1-C_4alkyl)$_2$, -C(=NOC_1-C_4alkyl)H, -C(=NOC_1-C_4alkyl)-C_1-C_4alkyl;

and phenyl and 5- to 6-membered heteroaryl, wherein the phenyl or 5- to 6-membered heteroaryl is optionally substituted with one to two substituents, each independently selected from the group consisting of halogen, -CN, C_1-C_6alkyl and C_1-C_3haloalkyl.

17. The compound according to claim 3, wherein

R4 is pyridine, pyrimidine, pyrazine or pyridazine, wherein the pyridine, pyrimidine, pyrazine or pyridazine is substituted with a total of one to three substituent(s),

provided at least one and up to three substituent(s) are independently selected from group A consisting of

-$CONH_2$, -CN, -NO_2, -NH_2, trifluoromethoxy, difluoromethoxy, 2,2,2-trifluoroethoxy, 2,2,3,3,3-pentafluoropropoxy, 4,4,4-trifluorobutoxy, methylthio, methylsulfinyl, methylsulfonyl, difluoromethylthio, difluoromethylsulfinyl, difluoromethylsulfonyl, trifluoromethylthio, trifluoromethylsulfinyl, trifluoromethylsulfonyl, methoxyiminomethyl, -NHCO-C_1-C_3alkyl, -NHCO-C_1-C_3haloalkyl, -NHCO-C_1-C_3cyanoalkyl, -NHCO-C_3-C_5cycloalkyl, wherein the cycloalkyl is optionally substituted with one to three substituents selected from the group consisting of cyano, fluorine, chlorine, methyl and C_2-C_4haloalkenyl; -NHCO-C_1-C_3alkyl-C_3-C_4cycloalkyl, -NHCO-phenyl, wherein the phenyl is optionally substituted with one to two substituents selected from the group consisting of fluorine and chlorine; -N(SO_2C_1-C_3alkyl)$_2$, -$NHSO_2C_1$-C_3alkyl, -$NHSO_2C_1$-C_3haloalkyl, -NHCS-C_1-C_3alkyl, -NHCS-C_3-C_4cycloalkyl, -NHCS-C_1-C_3alkyl- C_3-C_4cycloalkyl, -CONH(C_1-C_5alkyl), wherein the alkyl is optionally substituted with one to three substituents selected from the group consisting of cyano, fluorine and chlorine; -CON(C_1-C_3alkyl)$_2$, -CONH-C_3-C_4cycloalkyl, wherein the cycloalkyl is optionally substituted with one to three substituents selected from the group consisting of cyano, fluorine and chlorine; -CON(C_1-C_3alkyl)(C_3-C_4cycloalkyl), -CONH-phenyl, wherein the phenyl is optionally substituted with one to three substituents selected from the group consisting of cyano, fluorine and chlorine; -$CONHSO_2$-C_1-C_3alkyl, -CO_2C_1-C_4alkyl;

and phenyl and 5-membered heteroaryl, wherein the phenyl or 5-membered heteroaryl is optionally substituted with one to two substituents selected from the group consisting of fluorine, chlorine, bromine, -CN, difluoromethyl and trifluoromethyl;

the other one to two optional substituents are each independently selected from group B consisting of

fluorine, chlorine, bromine, iodine, -CN, methyl, cyclopropyl, difluoromethyl, trifluoromethyl, methoxy, trifluoromethoxy, difluoromethoxy, methylthio, methylsulfinyl, methylsulfonyl, difluoromethylthio, difluoromethylsulfinyl, difluoromethylsulfonyl, trifluoromethylthio, trifluoromethylsulfinyl, trifluoromethylsulfonyl and phenyl, wherein the phenyl is optionally substituted

with one to two substituents selected from the group consisting of fluorine, chlorine, bromine, -CN, difluoromethyl and trifluoromethyl.

18. The compound according to claim 4, wherein

R4 is 5-cyanopyridin-2-yl, 5-cyanopyrimidin-2-yl, 5-(trifluoromethoxy)pyrimidin-2-yl, 5-(difluoromethoxy)pyrimidin-2-yl, 4-cyanopyridin-2-yl, 5-(trifluoromethoxy)pyridin-2-yl, 5-(trifluoromethyl)-1,3,4-thiadiazol-2-yl, 5-chloro-4-(difluoromethyl)-1,3-thiazol-2-yl, 5-(4-fluorophenyl)-1,3,4-thiadiazol-2-yl, 1,1-dioxothiolan-3-yl, 5-(trifluoromethylthio)pyridin-2-yl, 5-(trifluoromethylsulfonyl)pyridin-2-yl, 5-nitropyridin-2-yl, 5-(difluoromethoxy)pyridin-2-yl, 5-aminopyridin-2-yl, 5-(methoxycarbonyl)pyridin-2-yl, 3-(difluoromethyl)-1-methyl-1H-pyrazol-4-yl, 5-(acetylamino)pyridin-2-yl, 5-[(cyclopropylcarbonyl)amino]pyridin-2-yl, 4-(4-chlorophenyl)-1,3-thiazol-2-yl, 5-[(4-fluorobenzoyl)amino]pyridin-2-yl, 5-[bis(methylsulfonyl)amino]pyridin-2-yl, 5-(methylcarbamoyl)pyridin-2-yl, 5-(2,2,2-trifluoroethoxy)pyridin-2-yl, 4-(2-fluorophenyl)-1,3-thiazol-2-yl, 1-methyl-3-(trifluoromethyl)-1H-pyrazol-4-yl, 5-[3-(trifluoromethyl)-1H-pyrazol-1-yl]pyridin-2-yl, 4-(3-chlorophenyl)-1,3-thiazol-2-yl, 4-(4-fluorophenyl)-1,3-thiazol-2-yl, 5-(methylsulfonamido)pyridin-2-yl, 6-cyanopyridin-2-yl, 1,3-benzoxazol-2-yl, 6-(2,2,2-trifluoroethoxy)pyridin-2-yl, 5-(2,2,3,3,3-pentafluoropropoxy)pyridin-2-yl, N-cyclopropyl-pyridin-2-yl-5-carboxamide, 5-methylsulfonylpyridin-2-yl, 6-methylsulfonylpyridin-2-yl, 5-(methoxyiminomethyl)pyridin-2-yl, 5-((2,2,2-trifluoroacetyl)amino)pyridin-2-yl, 5-((2-cyanoacetyl)amino)pyridin-2-yl, 5-pyrazolylpyridin-2-yl, 4,5-dihydrothiazol-2-yl, 5-((1-cyanocyclopropylcarbonyl)amino)pyridin-2-yl, N-(2,2,2-trifluoroethyl)pyridin-2-yl-5-carboxamide, 5-bromothiazol-2-yl, 4-(trifluoromethyl)thiazol-2-yl, 5-(trifluoromethyl)thiazol-2-yl, 5-imidazolyl-pyridin-2-yl, 5-(1,2,4-triazolyl)pyridin-2-yl, 5-chlorothiazol-2-yl, 5-(trifluoromethylsulfonylamino)pyridin-2-yl, 5-((cyclopropylethylthioyl)amino)pyridin-2-yl, 5-(cyclopropylcarbothioylamino)pyridin-2-yl, 5-(2-methylpropylthioylamino)pyridin-2-yl, pyridin-2-yl-5-carboxamide, 5-((1-chlorocyclopropylcarbonyl)amino)pyridin-2-yl, N-(4-fluorophenyl)pyridin-2-yl-5-carboxamide, N-cyclopropyl-N-methyl-pyridin-2-yl-5-carboxamide, N-methylsulfonyl-pyridin-2-yl-5-carboxamide, N-(1-cyanocyclopropyl)pyridin-2-yl-5-carboxamide, 5-iodothiazol-2-yl, 4-(2,4-difluorophenyl)thiazol-2-yl, N,N-dimethyl-pyridin-2-yl-5-carboxamide, N,N-diethyl-pyridin-2-yl-5-carboxamide, N-isobutyl-pyridin-2-yl-5-carboxamide, 5-((2-cyclopropylacetyl)amino)pyridin-2-yl, 5-((2,2-

difluorocyclopropylcarbonyl)amino)pyridin-2-yl, 5-((3,3-((Z)-2-chloro-3,3,3-trifluoro-prop-1-enyl)-2,2-dimethyl-cyclopropylcarbonyl)amino)pyridin-2-yl, 5-(propanoylamino)pyridin-2-yl, 5-((3-chlorobenzoyl)amino)pyridin-2-yl, 5-(4,4,4-trifluorobutoxy)pyridin-2-yl, N-ethyl-pyridin-2-yl-5-carboxamide, N-(1,2-dimethylpropyl)pyridin-2-yl-5-carboxamide, 5-((2-chlorobenzoyl)amino)pyridin-2-yl, N-cyanomethyl-pyridin-2-yl-5-carboxamide, N-(2-chlorophenyl)-pyridin-2-yl-5-carboxamide, N-(4-chlorophenyl)-pyridin-2-yl-5-carboxamide, N-(3-chlorophenyl)-pyridin-2-yl-5-carboxamide, or 4-pyrazol-1-yl-pyridin-2-yl.