CLAIMS

1. Process for treating a reaction crude containing a majority of a dialkyl disulphide obtained by oxidation of at least one alkyl mercaptan with sulphur, in an industrial apparatus, in which said reaction crude is brought into contact with at least one basic catalyst.

2. Process according to Claim 1, in which the alkyl mercaptan is a compound of formula RSH, and the dialkyl disulphide is a compound of formula RSSR, in which R represents a linear or branched alkyl radical containing from 1 to 20 carbon atoms, preferably from 1 to 10 carbon atoms, more preferably from 1 to 6 carbon atoms, more preferentially from 1 to 4 carbon atoms, it being possible for the alkyl radical R to also be substituted with one or more groups, which may be identical or different, chosen from halogens, amino, alkylamino, dialkylamino, carboxyl, alkylcarbonyloxy, alkoxycarbonyl, hydroxyalkyl, alkoxy, mercaptoalkyl, alkylthio, alkylcarbonylamino and alkylaminocarbonyl.

3. Process according to Claim 1 or Claim 2, in which the alkyl mercaptan is a compound of formula RSH, and the dialkyl disulphide is a compound of formula RSSR, in which R represents a linear or branched, unsubstituted alkyl radical containing from 1 to 10 carbon atoms, preferably from 1 to 6 carbon atoms, more preferably from 1 to 4 carbon atoms.

4. Process according to any one of the preceding claims, in which the alkyl mercaptan is methyl mercaptan, and the dialkyl disulphide is dimethyl disulphide.

5. Process according to any one of the preceding claims, in which the basic catalyst is a heterogeneous catalyst with respect to the reaction medium.

6. Process according to any one of the preceding claims, in which the basic catalyst is chosen from anion exchange resins, basic catalysts in free amine form, aluminas doped with sodium oxide and/or with potassium oxide, magnesium oxide (MgO), and the like, preferably the basic catalyst is an anion exchange resin.

7. Process for preparing dialkyl disulphide, comprising at least the following steps:
a) oxidation of an alkyl mercaptan with sulphur, by basic catalysis, so as to obtain a first reaction crude containing predominantly the corresponding dialkyl disulphide;
b) stripping of the H_2S formed;
c) distillation of the residual alkyl mercaptan;
d) separation of the heavy products (polysulphides);
e) final topping making it possible to eliminate the last traces of volatile compounds;
f) bringing the stream exiting step a), better still exiting step b), preferably exiting step c), more preferably exiting step d), or exiting step e), into contact with a basic catalyst enabling the elimination of the alkyl hydrodisulphide by conversion of said alkyl hydrodisulphide to dialkyl sulphide or dialkyl polysulphides;
g) recovery of the dialkyl disulphide containing an alkyl hydrodisulphide content of less than 50 ppm by weight, preferably less than 10 ppm by weight, more preferably less than 5 ppm by weight.

8. Process according to Claim 7, in which the alkyl mercaptan is methyl mercaptan and the dialkyl disulphide is dimethyl disulphide.

9. Process according to Claim 7 or Claim 8, in which step f) for eliminating the alkyl hydrodisulphide, giving dialkyl sulphide or dialkyl polysulphides, in the presence of a basic catalyst, can be performed after step a), b), c), d) or e), preferably after step a), b), c) or d), preferably after steps b), c) or d), quite particularly preferably after step d).

10. Use of at least one basic catalyst on a reaction crude containing a majority of a dialkyl disulphide of formula RSSR, obtained by oxidation of an alkyl mercaptan of formula RSH with sulphur, for increasing the overall productivity of the industrial synthesis of said dialkyl disulphide, in which R represents a linear or branched alkyl radical containing from 1 to 20 carbon atoms, preferably from 1 to 10 carbon atoms, more preferably from 1 to 6 carbon atoms, more preferentially from 1 to 4 carbon atoms, it being possible for the alkyl radical R to also be substituted with one or more groups, which may be identical or different, chosen from halogens, amino, alkylamino, dialkylamino, carboxyl, alkylcarbonyloxy, alkoxycarbonyl, hydroxyalkyl, alkoxy, mercaptoalkyl, alkylthio, alkylcarbonylamino and alkylaminocarbonyl.

11. Use according to Claim 10, in which the alkyl mercaptan is methyl mercaptan and the dialkyl disulphide is dimethyl disulphide.

Claims

1. A process for treating a reaction crude containing alkyl hydrodisulphide impurity and a majority of a dialkyl disulphide obtained by oxidation of at least one alkyl mercaptan with sulphur, the process comprising contacting said reaction crude with at least one basic catalyst in a separate step subsequent to the oxidation of the at least one alkyl mercaptan with sulphur to reduce the content of alkyl hydrodisulphide impurity.

2. The process according to Claim 1, wherein the at least one alkyl mercaptan is a compound of formula RSH, and the dialkyl disulphide is a compound of formula RSSR, wherein R represents a linear or branched alkyl radical containing from 1 to 20 carbon atoms, optionally substituted with one or more groups, which may be identical or different, and selected from the group consisting of halogens, amino, alkylamino, dialkylamino, carboxyl, alkylcarbonyloxy, alkoxycarbonyl, hydroxyalkyl, alkoxy, mercaptoalkyl, alkylthio, alkylcarbonylamino and alkylaminocarbonyl.

3. The process according to claim 2, wherein R represents a linear or branched alkyl radical containing from 1 to 10 carbon atoms, optionally substituted with one or more groups, which may be identical or different, and selected from the group consisting of halogens, amino, alkylamino, dialkylamino, carboxyl, alkylcarbonyloxy, alkoxycarbonyl, hydroxyalkyl, alkoxy, mercaptoalkyl, alkylthio, alkylcarbonylamino and alkylaminocarbonyl.

4. The process according to Claim 1, wherein the at least one alkyl mercaptan is a compound of formula RSH, and the dialkyl disulphide is a compound of formula RSSR, wherein R represents a linear or branched, unsubstituted alkyl radical containing from 1 to 10 carbon atoms.

5. The process according to Claim 4, wherein R represents a linear or branched, unsubstituted alkyl radical containing from 1 to 6 carbon atoms.

6. The process according to Claim 4, wherein R represents a linear or branched, unsubstituted alkyl radical containing from 1 to 4 carbon atoms.

7. The process according to Claim 1, wherein the at least one alkyl mercaptan is methyl mercaptan, and the dialkyl disulphide is dimethyl disulphide.

8. The process according to Claim 1, wherein the basic catalyst is a heterogeneous catalyst with respect to the reaction crude.

9. The process according to Claim 1, wherein the basic catalyst is chosen from anion exchange resins, basic catalyst in free amine form, aluminas doped with sodium oxide and/or with potassium oxide, and magnesium oxide (MgO).

10. The process according to Claim 9, wherein the basic catalyst is an anion exchange resin.

11. A process for preparing dialkyl disulphide, comprising:

a) oxidizing an alkyl mercaptan with sulphur, by basic catalysis, to obtain a first reaction crude

containing predominantly the corresponding dialkyl disulphide;

b) stripping H_2S formed;

c) distilling residual alkyl mercaptan;

d) separating polysulphides from the first reaction crude;

e) final elimination of traces of volatile compounds;

f) bringing at least one stream selected from the group consisting of streams exiting step a), step b), step c), step d), and step e), into contact with a basic catalyst to eliminate alkyl hydrodisulphide by converting said alkyl hydrodisulphide to dialkyl polysulphides; and

g) recovering the dialkyl disulphide containing an alkyl hydrodisulphide content of less than 50 ppm by weight.

12. The process according to Claim 11, wherein the alkyl mercaptan is methyl mercaptan and the dialkyl disulphide is dimethyl disulphide.

13. The process according to Claim 11, wherein step f) is performed after step a), step b), step c), or step d).

14. The process according to Claim 11, wherein step f) is performed after step b), step c), or step d).

15. The process according to Claim 11, wherein step f), is performed after step d).

16. The process according to Claim 11, wherein the dialkyl disulphide recovered in step g) contains an alkyl hydrodisulphide content of less than 10 ppm by weight.

17. A method for reducing the formation of alkyl hydrodisulphide during industrial synthesis of dialkyl disulphide of formula RSSR in a reaction crude obtained by oxidation of an alkyl mercaptan of formula RSH with sulphur, comprising:

contacting at least one basic catalyst with the reaction crude containing the alkyl hydrodisulphide impurity and the dialkyl disulphide of formula RSSR,

wherein R represents a linear or branched alkyl radical containing from 1 to 20 carbon atoms, optionally substituted with one or more groups, which may be identical or different, and the selected from the group consisting of halogens, amino, alkylamino, dialkylamino, carboxyl, alkylcarbonyloxy, alkoxycarbonyl, hydroxyalkyl, alkoxy, mercaptoalkyl, alkylthio, alkylcarbonylamino and alkylaminocarbonyl.

18. The method according to Claim 17, wherein R represents a linear or branched alkyl radical containing from 1 to 10 carbon atoms, optionally substituted with one or more groups, which may be identical or different, and selected from the group consisting of halogens, amino, alkylamino, dialkylamino, carboxyl, alkylcarbonyloxy, alkoxycarbonyl, hydroxyalkyl, alkoxy, mercaptoalkyl, alkylthio, alkylcarbonylamino and alkylaminocarbonyl.

19. The method according to Claim 17, wherein the alkyl mercaptan is methyl mercaptan and the dialkyl disulphide is dimethyl disulphide.