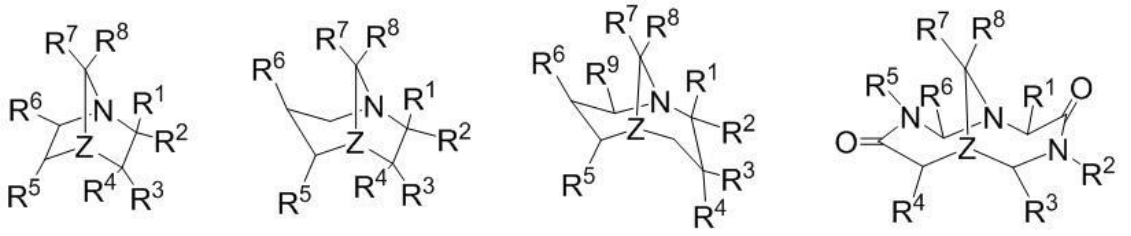
CLAIMS

1. A high-efficiency catalyst system for preparing azoxystrobin and an intermediate thereof, comprising one or more selected from an azabicyclic compound containing a methylene bridge or a salt thereof;

the azabicyclic compound containing a methylene bridge is one of the compounds represented by the following general structural formulae:



10A 10B 10C 10D ;

wherein, N represents a nitrogen atom, and Z represents a carbon atom or a nitrogen atom;

in the general structural formula, R^1, R^2, R^3, R^4, R^5, R^6, R^7, R^8, and R^9 are each independently hydrogen, halogen, hydroxyl, sulfydryl, amino, a C1-C16 ester group, C1-C16 alkoxyl, C1-C16 alkylthio, C1-C16 alkylamino or dialkylamino;

or, R^1 and R^2, R^3 and R^4, and R^7 and R^8 each independently combine into carbonyl, thiocarbonyl, a cycloalkyl thioether group, cycloalkoxyl or a ketal structure;

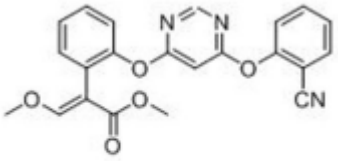
or, R^1 and R^3, and R^5 and R^6 each combine into a cycloparaffin structure or a heterocyclic structure containing a nitrogen or oxygen heteroatom;

or, R^7 and R^8 combine into cycloparaffin, cyclic aromatic hydrocarbon or an oxa- or aza-aromatic ring.

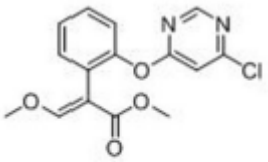
2. The catalyst system according to claim 1, wherein the salt includes sulfates, hydrochlorides, methanesulfonates, besylates, *para*-toluenesulfonates, trifluoromethanesulfonates, tartrates, oxalates, borates, phenyl borates, citrates, formates, acetates, C1-C16 alkyl carboxylates, and substituted or unsubstituted aryl formates.

3. A method for preparing azoxystrobin or an intermediate thereof, wherein in a solvent, in the presence of an acid-binding agent, the catalyst system according to claim 1 or 2 is used to

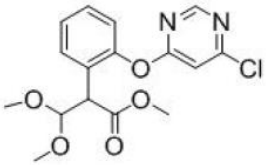
synthesize the azoxystrobin represented by Formula 1, a precursor of azoxystrobin represented by Formula 7, and an intermediate of azoxystrobin represented by Formula 2, Formula 3 or Formula 4;



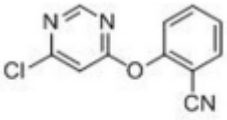
Formula 1



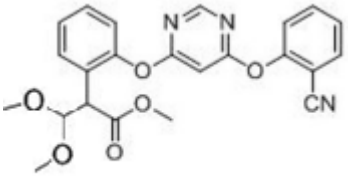
Formula 2



Formula 3



Formula 4



Formula 7

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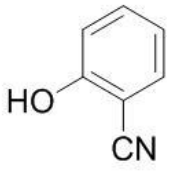
4. The method according to claim 3, comprising one of the following reactions:

(1) reacting salicylonitrile represented by Formula 9 or a salt thereof with the intermediate represented by Formula 2 and Formula 3 respectively, to produce the azoxystrobin represented by Formula 1 or the precursor of azoxystrobin represented by Formula 7,



Formula 9

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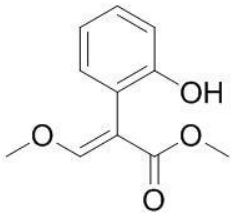
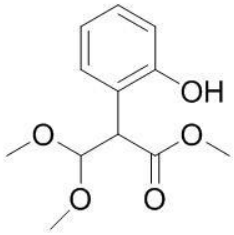
(2) reacting the intermediate represented by Formula 4 with the compound of Formula 5 and Formula 6 or a salt thereof respectively, to produce the azoxystrobin represented by Formula 1 or the precursor of azoxystrobin represented by Formula 7,





Formula 5 Formula 6

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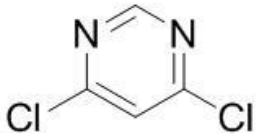
(3) reacting the compound of Formula 5 and Formula 6 or a salt thereof respectively with 4,6-dichloropyrimidine represented by Formula 8 to produce the intermediate represented by Formula 2 or Formula 3, and



Formula 8

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(4) reacting salicylonitrile represented by Formula 9 or a salt thereof with 4,6-dichloropyrimidine represented by Formula 8, to produce the intermediate represented by Formula 4.

5. The method according to claim 4, wherein for 1 mol of raw materials of the reaction, the catalysts of Formula 10A-Formula 10E are used in a total amount of 0.001 mol-0.1 mol, and preferably 0.005 mol-0.05 mol.

6. The method according to claim 4, wherein the solvent includes one or more selected from methanol, ethanol, propanol, isopropanol, n-butanol, isobutanol, toluene, tetrahydrofuran, acetonitrile, dichloromethane, N,N-dimethylformamide, N,N-dimethylacetylamide, dimethyl sulfoxide, sulfolane, sec-butyl acetate, n-butyl acetate, isopropyl acetate, n-propyl acetate, and ethyl acetate.

7. The method according to claim 4 or claim 5, wherein for l Kg of the salicylonitrile represented by Formula 9 or the salt thereof, the compound of Formula 5 or the salt thereof, the

compound of Formula 6 or the salt thereof, the 4,6-dichloropyrimidine represented by Formula 8, or the intermediates represented by Formula 2, Formula 3 and Formula 4 as the raw materials of the reaction, the solvent is used in a total amount of 1 L-20 L; if one or more solvents are used, any one of the solvents is used in an amount of 0.05 L-10 L.

8. The method according to claim 4, wherein the acid-binding agent is an alkoxy compound, hydroxide, carbonate or bicarbonate of an alkali metal or an alkaline earth metal, including sodium methylate, sodium ethoxide, sodium tert-butoxide, potassium tert-butoxide, lithium hydroxide, sodium hydroxide, potassium hydroxide, lithium carbonate, potassium carbonate, sodium carbonate, and cesium carbonate; or a tertiary amine containing a C2-C20 group, including one or more selected from triethylamine, triethanolamine, tributylamine, diisopropylethylamine, pyridine, N-methylpiperidine, and N-methylmorpholine; and

for 1 mol of the raw materials of the reaction, the acid-binding agent is used in an amount of 0.4 mol-2 mol, and preferably 0.8 mol-1.2 mol.

9. The method according to claim 4, wherein a phase-transfer catalyst is added in the process of the reaction to improve the catalytic activity of the catalyst system; wherein

the phase-transfer catalyst includes one or more selected from tetrabutylammonium fluoride, tetrabutylammonium chloride, tetrabutylammonium bromide, tetrabutylammonium iodide, cetyltrimethylammonium chloride, cetyltrimethylammonium bromide, dodecylbenzyldimethylammonium chloride, cetyldimethylbenzylammonium chloride, cetyltriphenylphosphonium chloride, (triphenylmethyl)triphenylphosphonium chloride, and tetraethylphosphonium chloride.

10. The method according to claim 4, wherein for the preparation of azoxystrobin or the precursor compound thereof, the reaction temperature is 40°C to 150°C, and preferably 70°C to 120°C; for the preparation of the intermediate of azoxystrobin, the reaction temperature is -20°C to 40°C, and preferably -5°C to 25°C.