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PROCESS OF PRODUCING FUNGICIDES AND
INSECTICIDES

Vittorio Casaburi, Naples, Italy

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1 Claim. (Cl. 167—22)

This invention relates to methods for preparing fungicides and insecticides for keeping down insects and fungi on plants, seeds, roots and trees. Compounds are used for this purpose which were intended hitherto for converting animal skins into leather and which are generally known under the general name of "syntans" (synthetic tanning agent). They are compositions usually prepared by sulphonating organic compounds and condensing the sulphonated products with aldehydes, or similar bodies capable of developing or liberating aldehydes. Sulphonated compounds have already been recommended for fungicidal insecticidal purposes, but experience has shown that such compounds are useless unless they are first changed into condensation products capable of converting raw animal skins into leather by the aforesaid treatment with aldehydes or aldehyde compounds. The present invention relates therefore only to those sulphonated compounds which are capable of being condensed by means of aldehydes (or substances that will develop or liberate aldehydes) and the synthetic tanning agent (syntans) formed thereby can be used as such, or in form of their salts.

It has been found that such bodies, well known in the leather art, either as such or more particularly in the form of their metal salts, can be employed in farming practice with great advantage, either as a seed or root fungicide, or even as a contact insecticide, solutions of the substances being sprinkled on the foliage of affected trees.

The new compounds also possess the great advantage of adhering for a prolonged period to foliage, seed or roots; also they have a specially good penetrating power. Furthermore, they are not poisonous to animals or man, so that, for instance, should more seed be treated with such compounds than is required for sowing, the rest could be used as food for poultry and the like.

In the case of metallic salts of synthetic tanning agent, (copper, mercury, iron chromium, lead salts, and so on), cellulose waste liquors, either from the alkaline or from the bisulfite processes, may be added to increase the adhering power, or may be compounded so that the lignone molecule will enter the molecule of the tanning compound before it is metallized.

The following examples show only some of the possibilities of the present invention, and are by no means meant to illustrate the whole field covered by the invention.

Examples

1. Beta-naphthol is sulphonated in excess of

sulphuric acid; for every 100 parts by weight of beta-naphthol 150 parts by weight of sulphuric acid (66° Bé) may be, for instance, used. As soon as the sulphonation product is soluble in water it is condensed with one molecule of formaldehyde, the usual precautions being observed. A synthetic tanning agent is thus formed, and it is caused to interact with the stoichiometric quantity of mercury oxide, HgO, which, after a time, will dissolve completely in the said syntan. Instead of mercury oxide itself, such compounds may be used which are capable of forming it, or their hydrates and similar salts which react between themselves to form mercury compounds soluble in the sulphonic tanning compound. According to the qualities desired in the fungicide, a certain amount of cellulose waste liquors may be added together with the aldehyde. For instance, a good product is obtained when three parts of alkaline waste liquors are added for every part of betanaphthol used for the condensation.

2. The synthetic tanning agent formed as in the first example is caused to interact with the stoichiometric quantities of oxides of iron, copper, chromium, lead and so on, either as such or in the form of their hydroxides or of such substances that can build them by reaction between themselves or can form soluble compounds with or in the sulphonic tanning compound.

3. The synthetic tanning agent formed as under 1 is caused to interact with the necessary quantities of copper or mercury sub-oxides (Cu₂O, Hg₂O). In this case a very small quantity of finely divided metal is also formed and falls to the bottom of the apparatus.

4. 100 parts by weight of betanaphthol are sulphonated in 150 parts by weight of sulphuric acid (66° Bé). As soon as the product has become soluble in water it is condensed with the calculated quantity of aldehyde. The excess acid is then partially neutralized and the condensation product afterwards caused to interact with the calculated amount of metal oxides, or hydroxides or of similar bodies than can build them by reacting between themselves or can form soluble compounds with or in the sulphonic tanning compound.

5. 100 parts of crude cresol, naphthalene, anthracene, and so on, are sulphonated with the necessary quantities of sulphuric acid. As soon as the reaction products are soluble in water, the sulphonated compounds formed are cautiously condensed with formaldehyde. The excess acid

in the reaction liquid is then partially neutralized, and the synthetic tanning agent then caused to interact with the calculated amounts of metal oxides (copper, mercury, lead iron, chromium, etc.) or with their hydroxides or mixtures of compounds which, by interaction between themselves
5 can form such oxide-compounds, or can form soluble metal compounds with or in the sulphonic tanning compound.

What I claim is:—

A process of producing fungicides and insecticides which consists in preparing a synthetic tanning agent by sulphonating β -naphthol and condensing the sulphonated product with formalde-
5 hyde, and causing the synthetic tanning agent thus produced to interact with a heavy metal oxide.

VITTORIO CASABURI.