Cl. 260

Published Apr. 20, 1943

Serial No. 414,982

ALIEN PROPERTY CUSTODIAN

PRODUCING SULFUROUS ORGANIC COMPOUNDS

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No Drawing. Application filed October 14, 1941

The present invention relates to a method of producing sulfurous organic compounds and consists in treating with elementary sulfur at temperatures above 175° C hydrocarbons the derivatives and substitutes respectively of which contain at least one CH=C< group.

It is well known that by the action of sulfur upon unsaturated organic compounds more or less instable sulfur addition products are obtained. This method was carried out by heating to temperatures between 150° and 170° C for a longer period of time linaloe oil, linalyl acetate or lavender oil. Moreover, it is known that instead of these alcohols or esters of the terpene row, pure terpenes, free of oxygen also were subjected to the action of sulfur at temperatures up to 150° C, whereby also sulfur addition products were obtained.

Furthermore, from the technics it is known that by the treatment of terpenes or their derivatives with elementary sulfur, so-called balsams are produced which technically are employed for the production of ceramic precious metal colors. It is also known that by the action of sulfur upon unsaturated organic compounds under known conditions derivatives of thiophenes of the most various constitution may result.

Now, the new mode of operation consists in heating to temperatures above 175° C certain initial substances, i. e. organic compounds containing at least one CH=C< group, with elementary sulfur or compounds easily delivering sulfur, for instance sulfur chloride or poly sulfides. It has been found that the observations made by earlier investigators that the addition of sulfur to unsaturated compounds at temperatures below 175° C was effected rather slowly on the one hand and on the other hand led to not well defined compounds. More or less oil-like substances with various sulfur content only were obtained.

However, if heating is effected to temperatures above 175° C, the sulfur is added to the double bond in a stoichiometrical proportion. Consequently the method according to the invention consists in producing sulfurous organic compounds from hydrocarbons the derivatives and substitutes of which contain at least one CH=C< group by treating these compounds with elementary sulfur in which the proportion of sulfur to non-sulfurized initial substance corresponds about to the proportion of 3 atoms of sulfur to one vinyl group each in the initial substance and heating the initial substances together with said sulfur to temperatures of above 175° C.

Examples

1. Anetholl with sulfur in a proportion of 1 mol:3 atoms is heated in an open container to temperatures between 190° to 230° C. At this temperature a prominent reaction is effected. After cooling the mass, a substance re-crystallizeable from organic solvents, as alcohol or acetone, remains.

This sulfurous substance supplies easily crystallizeable metal compounds and also additional products, as for instance products saturated or unsaturated with halogen alkyls the halogens of which in turn may be exchanged, for instance by hydroxyl groups. These well defined sulfurous compounds have disinfecting properties and are otherwise also valuable from a therapeutic stand of view.

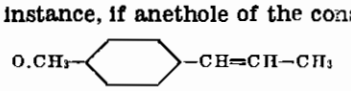
2. Myrcene or an ethereal or volatile oil containing mircene, for instance bay oil, is heated with sulfur in the same mol proportion as described above to a temperature of 200° to 210° C. Above 200° C a prominent reaction results during which the mass strongly swells then drops back again and finally during cooling leaves a caoutchouc-like mass.

The constitution of the newly formed body is not known. It may, however, be supposed that here a polymerisation with simultaneous addition of sulfur comes into consideration in which the sulfur probably has entered into the CH=C< group, whereas the C=CH_2— groups at the end of the carbon chain have rendered possible the polymerisation.

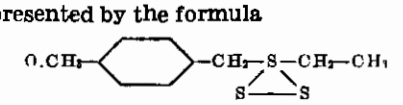
The above example shows that sulfurous products of polymerisation having caoutchouc-like properties may be obtained from unsaturated organic compounds which contain C=CH_2— groups at the end of the carbon chain as well as a CH=C< group in the molecule.

This reaction is not limited to bodies having the constitution stated in the preceding examples. The supposition only is of importance that always at least one CH=C< group is present in the molecule and the entrance of the sulfur is effected at temperatures of above 175° C.

So, for instance, if anethole of the constitution



is treated in accordance with the present invention with sulfur, a substance is obtained having 3 atoms of sulfur in the molecule and which may be represented by the formula



and for which the ring of the 3 sulfur atoms is characteristic.

The same result is obtained if corresponding other initial substances are used which always must correspond to the requirements stated regarding the above mentioned double bonds.

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