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TREATMENT OF UNSATURATED HYDRO-CARBON OILS

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Applicant has carried out considerable investigation on the selective oxidation, for partial removal of hydrogen, or dehydrogenation of petroleum and chlorinated petroleum oils to produce unsaturated and chlorinated unsaturated hydrocarbons and has recently been granted patents on some of this work.

In synthesizing these unsaturated hydrocarbons both by liquid and by vapor phase selective oxidations, small percentages of alcohols, aldehydes, ketones and acids are formed. Probably due to the presence of these constituents, and more especially the aldehydes, the unsaturated and chlorinated unsaturated hydrocarbon oils produced have a very disagreeable, penetrating odor. Practical methods have not been found to remove this odor as by washing with water or other solvents. It has been ascertained, however, that by heating these unsaturated and chlorinated unsaturated hydrocarbons with vegetable oils, such as linseed, tung and soya bean oils, that the disagreeable penetrating odor may be practically eliminated. Its removal is also helped by the addition of small percentages of phenols or cresols, or of organic compounds containing the amino grouping, such as urea, thiourea, etc. to the unsaturated oils, with heating of the oils as treated. In other words organic amino compounds which form synthetic resins with aldehydes when heated with the unsaturated oils under consideration tend to destroy their disagreeable odor.

An unsaturated hydrocarbon oil was synthesized from a heavy fuel oil by selective oxidation for removal of hydrogen, or so-called dehydrogenation, in an atmosphere of about seven percent of oxygen and ninety-three percent of nitrogen, at seventy pounds superatmospheric pressure and about two hundred and fifty degrees centigrade, using a mixture of copper and iron (ferric) oxides as catalysts supported on asbestos. One hundred grams of this synthesized oil were heated to about one hundred and sixty-five degrees centigrade with twenty grams of linseed oil for about an hour. Its original penetrating, disagreeable odor was thereby practically eliminated. The odor was similarly eliminated or destroyed when using tung or soya bean oil in place of linseed oil. About one-tenth percent of phenol added to the unsaturated petroleum and linseed oil mixture was further helpful toward removing the initial sharp, penetrating odor, that is, after heating the said mixture as above noted. Also urea and thiourea were used in place of phenol. They, in amounts of about one-tenth to

three percent, were heated with the same unsaturated hydrocarbon oils, both with and without the addition of vegetable oils and gave very satisfactory results. These tests were simple but very conclusive. Linseed oil even to as low as five percent content on the unsaturated hydrocarbon oils appeared to be satisfactory. The unsaturated, chlorinated hydrocarbon oils were similarly treated and applicant's findings were fully as positive. A heavy fuel oil was oxidized in the vapor phase at about four hundred degrees centigrade and atmospheric pressure with about ten percent of oxygen and ninety percent of nitrogen, as diluent, for removal of three to five percent of hydrogen, using catalysts from the oxides of manganese, iron and zinc. This oil was also treated similarly to the liquid phase oxidized oils and also with similarly satisfactory results. Temperatures of treatment for this work of between one hundred and two hundred and fifty degrees centigrade were used.

Of course, relative percentages of the materials used for treatments could be varied ad infinitum and temperatures and periods of treatments likewise might be varied within rather wide ranges without too materially affecting the results sought.

I claim:

1. In a process for the freeing from a penetrating disagreeable odor of products of the class consisting of unsaturated hydrocarbons and chlorinated unsaturated hydrocarbons produced by dehydrogenation of petroleum oils and chlorinated petroleum oils with the use of oxygen and catalytic materials at higher temperatures and various pressures, the step of heating these oils with vegetable oils.

2. In a process for the freeing from a penetrating disagreeable odor of products of the class consisting of unsaturated hydrocarbons and chlorinated unsaturated hydrocarbons produced by dehydrogenation of petroleum oils and chlorinated petroleum oils with the use of oxygen and catalytic materials at higher temperatures and various pressures, the step of heating these oils with vegetable oils and organic amino compounds which form resins with formaldehyde.

3. In a process for the freeing from a penetrating disagreeable odor of products of the class consisting of unsaturated hydrocarbons and chlorinated unsaturated hydrocarbons produced by dehydrogenation of petroleum oils and chlorinated petroleum oils with the use of oxygen and catalytic materials at higher temperatures and

various pressures, the step of heating these oils with about twenty percent of linseed oil and one tenth to three percent of urea.

- 5 4. In a process for the freeing from a penetrating disagreeable odor of products of the class consisting of unsaturated hydrocarbons and chlorinated unsaturated hydrocarbons produced by dehydrogenation of petroleum oils and chlori-

nated petroleum oils with the use of oxygen and catalytic materials at higher temperatures and various pressures, the step of heating these oils with about twenty percent of linseed oil and one-tenth to three percent of urea at one hundred and fifty to two hundred degrees centigrade.

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