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PROCESS AND REAGENT FOR DESALTING
CRUDE OILS

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5 Claims. (Cl. 196—4)

This invention relates to a method of desalting crudes and breaking crude oil-B. S. and other petroleum oil emulsions, and to a composition for accomplishing these results.

Crude oils often contain a relatively high percentage of salts, chiefly inorganic, in suspension. This is particularly true of those crudes obtained from acid treated wells. It is necessary to remove these salts prior to further refining of crude in order to prevent clogging and corrosion of refinery equipment.

One of the objects of this invention is to provide a method for desalting crudes and breaking oil and similar emulsions.

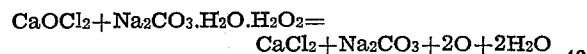
Another object of the invention is to provide a composition which is particularly effective in removing or reducing the salts in crude oils and breaking emulsions of the type above referred to.

In carrying out the process in accordance with my invention I use a reagent composed primarily of a compound which contains an (OCl) group, such as calcium hypochlorite, sodium hypochlorite, or bleaching powder, together with a compound which contains an H_2O_2 group, or any other group capable of easily liberating nascent oxygen such as sodium-perborate, hydrogen-peroxide, or sodium-peroxide. The hypochlorite-containing material and the peroxide-containing material may be added together or separately. The materials may be admixed before use in several ways as follows: (1) by keeping the materials in a dry condition, (2) by protecting one of the reagents with an inert film such as soap, stearic acid, paraffin, etc., (3) by suspending the reagents in a water free medium such as petroleum oils, coal oils, etc. If added separately, they may be added in the dry state or in solution. If hypochlorite or hypochlorite-containing material which is partially or totally insoluble in water is used, an acidic material may be added thereto in order to render the material water soluble. Acids suitable for this purpose are preferably dry organic acids, such as tartaric acid, or inorganic dry acidic materials, such as sodium-bisulfate. Where the hypochlorite is mixed with an organic acidic reagent it is preferable to add a stabilizer such as a soluble chromate or dichromate in small amounts in order to prevent chlorination of the acid by the hypochlorite. Other materials may be admixed with the hypochlorite or the peroxide in order to act as fillers and to prevent too rapid reaction of the reagents. Sodium carbonate or bicarbonate is suitable for this purpose. The reagents are preferably used in such proportions

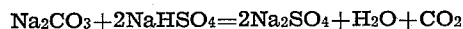
that the peroxide containing material will be present in an amount equivalent to approximately 15-20 parts of sodium peroxide; the hypochlorite will be equivalent to approximately 15-20 parts of calcium hypochlorite, and the remainder will be 60 parts of sodium carbonate, or other filler material. The hypochlorite and the peroxide together each release an atom of oxygen and the two reagents should be mixed in such proportions that the available oxygen content of one is equal to the available oxygen content of the other. The mixture is used in amounts of from .05 to .5%, based on the quantity of crude oil or other material to be treated. It is not essential that the material be heated during the treatment, but in the case of tight emulsions, desalting and deemulsification are facilitated by heating the crude material to a temperature of approximately 100 to 135° F. during admixture with the reagents.

I preferably use chloride of lime and sodium peroxide because of their cheapness and availability. As a peroxide containing material I may use a compound corresponding to the formula $Na_2CO_3 \cdot H_2O \cdot H_2O_2$, in which the hydrogen peroxide has been substituted for a molecule of water of crystallization. Other hydrous salts may be substituted for a sodium carbonate, in which at least part of the water of crystallization has been replaced by hydrogen peroxide in the same manner.

When the hypochlorite containing material and the peroxide containing material are admixed in the presence of water, they react according to the following equation, liberating nascent oxygen thereby effectively breaking the emulsion and precipitating the salt.



A further reaction takes place between the carbonates present in the mixture if an acidic material such as those above referred to is also present, thereby liberating carbon dioxide which assists materially in breaking emulsions. The reaction is as follows:



Thus it is advantageous to add sufficient acidic reagent to react with a substantial part of the carbonate, but insufficient to render the resulting solution acid, thereby preventing corrosion of the refinery equipment.

Broadly, my invention includes treatment of salt containing and emulsified oils with reagents,

which when brought into contact with each other, liberate a nascent gas capable of acting on such oils to precipitate the salts and break the emulsion.

5 I claim as my invention:

1. A method of desalting oils and breaking water in oil emulsions which comprises treating such oils with a mixture of bleaching powder and a solid compound containing hydrogen peroxide.
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2. A method of desalting oils and breaking water in oil emulsions characterized by subjecting the oils to the reaction of a reagent comprising a dry mixture of an alkaline hypochlorite, an acid, a compound containing hydrogen peroxide, and a stabilizing agent to prevent chlorination of the acid by the hypochlorite.
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3. A reagent for desalting oils and breaking water in oil emulsions which comprises bleaching powder and $\text{Na}_2\text{CO}_3 \cdot \text{H}_2\text{O} \cdot \text{H}_2\text{O}_2$.

4. A reagent for desalting oils and breaking water in oil emulsions comprising a dry mixture of an alkaline hypochlorite, a soluble chromate, an acidic body and a compound containing hydrogen peroxide. 5

5. The method of desalting oils and breaking water-in-oil emulsions which comprises treating the same with a mixture of an alkaline hypochlorite, and at least one compound capable of liberating nascent oxygen from the group consisting of sodium perborate, sodium peroxide and hydrogen peroxide. 10 15

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