28. Study on Organosols. (III)

Mercury Organosols Obtained by a Chemical Method.

Itsuro Yamakita and *Fuku Takenaka.*

In the authors' laboratory, various methods of preparing organosols were discovered about 20 years ago, and these methods were utilized for the manufacture of colloidal medicines and ship's bottom paints. Besides these studies in the applied field, fundamental researches on gold and silver organosols formed by a chemical method were carried out and their results were already reported.

In this report, some experimental facts as to mercvry organosols formed by the same chemical method above mentioned using mercuric oxide as staring substance, are described.

The possibility of formation of mercury organosols in various organic dispersing media such as fats, oils and homologous series of fatty acids were examined. It was confirmed that the coexistence of free fatty acids is essential for the formation of mercury organosol in the case of fats and oils.

In any cases examined, so finely dispersed mercury organosols as in the case of gold and silver organosols were not obtained. Particle size of dispersed mercury was determinee by a micrometer and it was recognized that its range of magnitude is from 0.25 μ to 6 μ and this particle size corresponds to that of general emulsions.

The viscosity of mercury organosols was measured and it was found that the relation between the concentration of dispersed mercury particles and the viscosity of the sol is linear, and the coefficent for the rate of viscosity increment varied from 2.52 (at 53°C) to 5.44 (at 13°C). From this point, the condition of dispersed mercury in dispersing media was deduced from Einstein's viscosity equation.

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29. On the Decolorization of Rice-waxoil.

Itsuro Yamakita and *Tetsuro Yamauchi.*

Many studies have been reported on the purification of rice oil difficult to decolor. One of the authors already pointed out that rice-oil of high acid value dissolved iron with which it comes into contact during its production and storage, and the oil was greatly contaminated by the dissolved iron.

In this study we compared quantitatively decolorizations of rice-waxoil treated with various methods separately or combined.

Rice-waxoil, which deposited in crude rice-oil, was melted and filtered from such impurities contained in oil as rice-bran. Thus treated rice-waxoil was dissolved in turpentine oil after the following various treatments, and their color of the solutions was compared with each other colorimetrically to evaluate the effects of these treatments.

Firstly, rice-waxoil, being separated from impurities, was washed by stirring respectively with 3 or 4 volumes of 2% solutions of various inorganic and organic acids, salts, reducing agents and oxidizers. Experimental results showed that inorganic acids, such as hydrochloric-, nitric-, and sulfuric acids, reducing organic acids such as oxalic- and citric acids and salt such as sodium oxalate were effective for the decolorization of rich-waxoil, and actually decolorized samples were faded in brown and became organge-yellow or green.

Next, the samples, after the thorough washing dy dilute sulfuric acid solution, were further subjected to acid-clay treatment, oxidation, reduction etc. The results showed that oxidation with 30% hydrogen peroxide caused decolorization, and acid-clay treatment and catalytic hydrogenation had also some effects, and treatment with catalytic hydrogenation followed by hydrogen peroxide, gave a yellowish- white substance which was rendered reddish-brown by washing with iron salt solution.

From the above experimental results we conclude that the coloring of crude rice-waxoil is reduced by acid solution treatment, which means the removal of iron soaps from the oil, and greenish color coming from vegetable coloring matters is removable by acid-clay treatment, and organge or light-brown color due to the natural or secondary coloring substances of rice-waxoil is only decolorized by sevrre reduction or oxidation process.

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30. Studies on Ship's Bottom Paints.

Solubility of Cuprous Oxide Included in Antifouling Paints.

Itsuro Yamakita, Yoshio Araki and *Sadao Shimomoto.*

Antifouling effects of ship's bottom paints are thought, to large extent, to depend upon the solubility of cuprous oxide in sea water, which has been proposed as one of antifouling toxics. We tried to examine some influences upon the solubility of cuprous oxide. In our experiments, glass plates were coated with various paints, and dipped in water and 3% NaCl solution respectively. After 7 days, copper content of the water and NaCl solution were determined respectively both polarographically and colorimetrically with potassium xantogenate.

The compositions of the paints and the quantity of copper dissolved from 1 square cm. of each paint surface in 7 days were as follows.

1) Influence of Vehicles upon the Solubility of Copper.

Rosin, 20%; One of 5 Kinds of Vegeable Oils, 20%; Turpentine Oil, 20%; Cu_2O, 40%.