

CONCENTRATION OF RUBBER LATEX BY CREAMING

THE concentration of rubber latex by creaming was first noticed by Traube.^{1,2} Since then creaming has been used on a large scale in the preparation of latex concentrates. The creaming agents generally used are gums, pectins, gelatin, alginates and other similar hydrophilic colloids.

While working on the concentration of rubber latex the author has found that the seeds of *Adenanthera pavonina* (Coral Wood) provide a new source of creaming agent for rubber latex. Coral wood tree is found in the Himalayas, Western Ghats and Sylhet.

A convenient quantity of the powdered seeds was kept soaked in five to six times its weight of water for about four hours. The aqueous solution was decanted off, and the pasty mass mixed with seven to eight times its weight of water, and heated at 80° to 90° for about four hours. It was then filtered, and filtrate concentrated to about one-fourth of its original volume. Ninety-five per cent. alcohol was then added in such quantities that the final concentration of the alcohol did not go below 70 per cent. The flocculent precipitate that was formed was filtered, washed, dried and powdered. The yield of the material was about 5 to 6 per cent. based on the dry weight of the seeds. For concentration of rubber latex a 2 per cent. aqueous solution of the above powder was used.

To rubber latex of 30 per cent. D.R.C., was added 0.2 per cent. (based on aqueous phase) of the creaming agent. After thorough mixing the rubber latex was kept undisturbed. Creaming started in about an hour, and was complete in about 12 to 14 hours. A cream of 58 to 60 per cent. D.R.C. separated at the top. The serum was found to contain less than 0.5 per cent. rubber.

This creaming agent gave the following reactions, usually characteristic of pectins:—

- (1) Ten c.c. of a 1 per cent. aqueous solution of the creaming agent when mixed with 1 c.c. of a 10 per cent. solution of thorium nitrate set to a firm gel in about two minutes. This gel-formation was not observed in the presence of acetic acid.³
- (2) Addition of calcium chloride solution to an aqueous solution of the creaming agent in presence of acetic acid resulted in the precipitation of calcium pectate.^{4,5}

Further details will be published later.

The author's thanks are due to Sir Jnan Chandra Ghosh, kt., D.Sc., F.N.I., for his keen interest in this work.

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June 28, 1945.

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1. Traube, *Brit. Pat.*, 1924, 226, 440. 2. —, *Gummi Ztg.*, 1925, 39, 434, 1647. 3. Bryant, *Ind. Eng. Chem. (Anl. Ed.)*, 1941, 13, 103. 4. Carre and Hayne, *Biochem. J.*, 1922, 16, 60. 5. Nanji and Norman, *Ibid.*, 1928, 22, 596.

FERRIC TUNGSTATE GEL

IN communications¹ from these laboratories the conditions of preparation of several ferric sols have been described. In this note the condition of formation of ferric tungstate gel has been investigated. Holmes² obtained gels of ferric phosphate and chromic arsenate. Ferric borate sols and gels were obtained by Prakash and Dhar.³ Prakash⁴ obtained a gel of ferric tungstate for the first time by mixing a 15 per cent. solution of sodium tungstate with M/2 ferric chloride solution.

I have observed that in presence of glucose ferric chloride dissolves a considerable amount of sodium tungstate to give a deep red positively charged sol of ferric tungstate. If this sol be purified by dialysis and then coagulated by electrolytes it sets to transparent jellies with slight opalescence.

To 50 c.c. of ferric chloride solution (corresponding to 69.84 gm. of Fe_2O_3 per litre) was added 10 c.c. of 20 per cent. glucose solution and 40 c.c. of 10 per cent. $Na_2WO_4 \cdot 2H_2O$ was slowly run into this mixture. The mixture was vigorously shaken and was then allowed to dialyze for three days. The purified sol thus obtained had the empirical formula $2 Fe_2O_3 \cdot Fe_2(WO_4)_3$ and set to jellies when coagulated with KCl or K_2SO_4 .

The influence of the variation of the concentration of the coagulating electrolyte on the time of setting of the gel is shown in the following tables:—

TABLE I

Amount of sol taken	3 c.c.	Total volume	6 c.c.
Amount of N/50 K_2SO_4 (c.c.)	3	2.8	2.6 2.4 2
Time of setting (Minutes)	14	40	70 140 No jelly

TABLE II

Amount of sol taken	2 c.c.	Total Volume	4 c.c.
Amount of N/2 Kel (c.c.)	2	1.9	1.8 1.7
Time of Setting (Minutes)	5	13	30 No jelly

It has been further observed that this sol itself sets to a transparent jelly when kept in a Jena bottle for about fifteen days.

The author expresses his deep gratitude to Dr. Satya Prakash for guidance during the progress of this work.

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June 15, 1945.

1. Prakash and Mushran, *Allahabad Univ. Studies*, 1943, 19, 1; Mushran, *Curr. Sci.*, 1945, 14, 123. 2. Holmes and Co-workers, *J. Amer. Chem. Soc.*, 1918, 40, 1014. 3. Prakash and Dhar, *J. Ind. Chem. Soc.*, 1930, 7, 307. 4. —, *Ibid.*, 1929, 6, 587.

ISOLATION OF SOME TOXIC FACTORS FROM ARGEMONE OIL

ARGEMONE OIL has been held to be the factor responsible for causing epidemic dropsy in man by a number of investigators especially by Lal *et al.*¹ Sarkar² pointed out certain anomalies of the theory and stressed on the fact that a definite solution of the problem could

only be arrived at by isolating the active substances both from the argemone oil and the toxic mustard oil and then showing that they were chemically identical and that they also possessed similar physiological properties.

In their latest communication on the subject, Lal *et al.*³ stated that the nitrogenous bases they had been able to separate, so far, were not toxic to man but might produce some histological changes in albino rats without any mortality however. They suggested that the substances they had been able to isolate formed part of an original complex toxic molecule. Their attempts to recombine the split products into this hypothetical toxic molecule did not materialise.

Attempts were made, therefore, to isolate compounds from argemone oil in various ways and to see if any of them were toxic. Accordingly, a number of compounds giving tests for alkaloids were obtained from this oil by (1) saponification method of Lal *et al.*,⁴ (2) HCl gas extraction method of Lal *et al.*,⁴ (3) ferric chloride method of Sarkar,⁵ (4) extraction with cold dilute hydrochloric acid, 1:4, and (5) precipitating the nitrogenous bases as picrate.

By methods (3) and (4) hydrochlorides of base or bases were obtained directly. Compounds obtained by the other methods were converted into hydrochlorides with great difficulty.

The toxicity of these compounds were then tested by administering to young albino rats aqueous solution of various hydrochlorides orally in 1 mgm. daily doses. It was observed that hydrochlorides of compounds obtained by methods (1) and (2) were not much toxic but those obtained by methods (3) and (4) were definitely toxic having produced more than 50 per cent. mortality within 30 and 44 days respectively. The hydrochloride obtained from the picrate (method 5) appeared to be the most toxic since there was cent. per cent. mortality. It was even fairly toxic in 0.5 mgm. dose as there was 50 per cent. mortality within 22 days.

Further investigation showed that this picrate was a crude mixture from which so far two definite fractions could be isolated. One of them (Fraction I) is of light yellow colour and the other one (Fraction II) was of red colour.

Fraction I after several recrystallisations melted at 220-222°C. with decomposition. Toxicity determinations carried out with 1 mgm. daily dose of the hydrochloride as before showed that this fraction was much more toxic and two out of three rats died within a week. The post-mortem examination showed that there was punctate hæmorrhage in the liver with marked congestion, the heart was dilated and there was passive congestion in lungs and kidneys. There was also a marked bloating up of the intestine and stomach. The animals appeared to have developed a limp gait before death showing paresis of hind legs. In addition there was a marked dyspnoea and the condition of rats was very low.

Fraction II after several recrystallisations melted at about 250°C. with decomposition.

The hydrochloride from this picrate was also very toxic as there was cent. per cent. mortality within 23 days. The post-mortem examination showed that the liver was congested and there were hæmorrhagic patches here and there. The heart was dilated and in lungs hæmorrhage was noticeable. The kidney showed signs of passive congestion.

Argemone oil, therefore, contains at least two toxic compounds. It should be borne in mind, however, that mere isolation of two toxic substances does not necessarily imply that they are really the causative factors in epidemic dropsy and to settle this point satisfactorily other data would be necessary.

Further work is in progress and details will be published elsewhere in due course.

Our best thanks are due to Professors J. K. Chowdhury, F.N.I., and S. N. Bose, F.N.I., for their kind interest.

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May 21, 1945.

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1. Lal *et al.*, *Ind. Jour. Med. Res.*, 1939, **27**, 207.
2. Sarkar, *Ann. Biochem. Exp. Med.*, 1941, **1**, 59, 203.
3. Lal *et al.*, *Ind. Jour. Med. Res.*, 1941, **29**, 839. 4. —, *Ibid.* 1941, **29**, 361. 5. Sarkar, *Ann. Biochem. Exp. Med.*, 1941, **1**, 271.

CUPRIC PENTAMMINO-SULPHATE

THE deep blue liquid obtained by dissolving copper sulphate in a solution of ammonium hydroxide has been studied by numerous workers. C. Immerwahr¹ suggested that in the solution Cu⁺⁺ ions are replaced by more complex cupric-amino ions. A. Reychler,² D. P. Konowaloff,³ W. Gaus,⁴ and J. Locke and J. Forsall,⁵ by freezing point, absorption and vapour pressure measurements respectively found the compound formed to be Cu(NH₃)₄-SO₄. H. M. Dawson and J. Mc Crae,⁶ D. W. Horn,⁷ A. A. Blanchard,⁸ P. Job,⁹ S. Glassstone¹⁰ and others have all found the same formula by various means. S. S. Bhatnagar, D. N. Goyle and M. Prasad,¹¹ however, ascribe the blue colour of the solution to colloidal copper hydroxide. In a recent communication¹² we have reported the existence of bi-, tetra-, penta- and hexa-amino compounds in the solution.

A blue amino compound was isolated by adding alcohol to the blue solution of ammoniacal copper sulphate. This compound was filtered, washed with alcohol and decomposed by adding a solution of caustic soda when black copper oxide precipitated out and was estimated. The ammonia evolved was absorbed in a standard sulphuric acid solution and was then estimated. As a result of the analysis the amounts of both copper and ammonia were known and the Cu:NH₃ ratio was found to be 1:5. The compound thus isolated, which was so far called to be the tetramino compound, was now found definitely to be the cupric pentamino sulphate.

Detailed procedure and results of the method