

Paper AND Pulp News.

DEVOTED TO THE INTERESTS OF CANADIAN PULP AND PAPER MAKING.

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CHEMISTRY IN THE PAPER MILL.



PAPERMAKERS are constantly meeting with disappointments and loss, owing to the adulteration of materials which they use in the process of manufacture. With many substances, like aniline dyes, mineral coloring matters and pigments, lubricating oils, sulphuric acid, and others, there is so much room and opportunity for adulteration to counterbalance a drop in price. And this adulteration can be effected in such a manner that, when the price is taken into consideration, it can hardly be said that the quality is always inferior, in respect of the work produced from a known weight. This is more particularly true of substances in which there is a keen competition for trade. The detection of added substances or of actual impurities is not an easy matter for any but a trained chemist, and although in some cases various tests are fairly reliable, yet these can only be trusted when the substances treated behave or react exactly as described. When the reaction differs slightly from that expected, the conclusions to be drawn therefrom need the special care which only an expert can give. At the same time, certain simple tests may be used in trying raw materials, and then the papermaker will be able to judge whether a complete analysis is advisable.

If, for example, some burnt lime is tested for carbonate of lime, and this is shown to be present, then, if desirable, the percentage of chalk can be determined by an analytical chemist. If some 60 per cent. caustic soda shows a large proportion of common salt by a test which can easily be applied by the papermaker, then the test is of service in enabling him to decide as to the necessity of further analysis.

The "strength" of papermakers' chemicals, to use a well-known and familiar phrase, differs very largely. Thus, caustic soda and soda ash are often reduced in strength or alkalinity by the addition of common salt, simply to meet the demand for various grades. This is not adulteration as commonly understood.

Some of the simpler tests which can be applied to various papermakers' chemicals may here be described:

BURNT LIME.

Sand and grit may be detected by dissolving the lime in dilute hydrochloric acid. Any insoluble residue consists of sand, stones and dirt, which ought not to be present in quan-

tity. Effervescence, on the addition of acid, also reveals the existence of chalk, proving that the lime was improperly or incompletely burned.

CAUSTIC SODA.

Chlorides may be detected by dissolving a small quantity of soda in water, acidifying with nitric acid, and then adding a few drops of silver nitrate solution. Turbidity indicates traces only, while any decided precipitate denotes larger quantities.

Sulphates are determined by the formation of a white granular precipitate, when a solution of barium chloride is added to a solution of the soda which has been previously neutralized with an excess of hydrochloric acid.

ALUM CAKE.

Free acid may be detected by means of congo-red test papers, litmus being useless for the purpose. The red color of the papers is changed to blue by merest traces of acid.

Iron salts are undesirable impurities in alum. A few drops of rhodanammium solution will give a pale red or deep red coloration, when added to a solution of the alum, according to the proportion of iron salts present.

STARCH.

Added mineral substances may be detected by igniting a weighed quantity of starch and finding the weight of residue, which, with pure starch, should not exceed 1 per cent.

Chalk, if present, will reveal itself by the effervescence produced when a few drops of dilute hydrochloric acid are poured upon the starch.

CHINA CLAY.

Chalk is determined by effervescence produced by the addition of hydrochloric acid to a sample of the clay.

Iron salts, if present, are colorless ferrous salts. If a small quantity of the suspected clay be moistened with a few drops of hydrochloric acid, and some potassium ferrocyanide be added, a bluish coloration, more or less distinct, will be produced.

BLEACHING POWDER.

Dirt, metallic particles, etc., can be detected by a careful inspection of an average sample.

Compounds of lime, other than the chloride of lime, cannot be considered as hurtful ingredients, provided the percentage of available chlorine is up to the agreed strength.

ANILINE DYES.

Added mineral substances may be detected by igniting a small quantity of dye. Any expressive residue will point to the presence of adulterants. Since these dyes are soluble in alcohol, they can also be tested for these impurities by treatment with