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STRIPPING TIN FROM COPPER

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This invention relates to chemistry and more particularly to an improved method of stripping tin from a metal base.

The customary method of stripping tin from a base metal such as copper or copper alloys is to immerse the coated metal in a bright dip solution. The difficulty with this method is that selective etching frequently occurs and produces a very poor surface. This makes the surface finish unsatisfactory and the base metal either must be scrapped or be salvaged by some form of polishing operation. There are several other methods but most of these methods are slow or otherwise objectionable.

It is an object of my invention to provide a rapid inexpensive method of stripping tin from a metal base, especially from bases of copper or copper alloy which will not selectively etch or otherwise damage the surface of the base metal.

These and other objects are attained by immersing the tin coated base metal in a dilute sulphuric acid solution containing copper ions for a period of time sufficient to remove the tin.

Preferably the aqueous dilute sulphuric acid solution contains about 6% sulphuric acid by volume. The optimum amount of copper ions in the solution is from 28 to 56 grams per liter or 3.8 to 7.6 ounces per gallon. Lesser concentrations slow down the rate of stripping while higher concentrations do not materially increase the rate of stripping. This solution strips a tin coating at the rate of .0001 of an inch for each ¼ to ½ minute of immersion when the temperature is maintained at the preferred temperature of about 180° F. The copper may be introduced into the solution either as pure metal or as an oxide or as a salt. Of course, the oxide or salt must be sufficient in amount to provide the copper ion concentration indicated above. For example between 50 and 100 grams per liter or between 6.7 and 13.5 ounces per gallon of copper sulphate will be required. Or between 37.5 and 75.0 grams per liter or between 5.0–10.0 ounces per gallon of anhydrous copper nitrate will be required to produce the ions or between 20 and 40 grams per liter or between 2.7 and 5.4 ounces per gallon of cuprous chloride or between 26.6 and 53 grams or 3.56 and 7.1 ounces per gallon of cupric chloride will be required to supply the copper ions for the optimum concentration. Copper nitrate is less satisfactory since its use causes a noticeable attack on the copper base metal.

If there is any organic material upon the tin coating this must be removed by other methods such as by immersion in concentrated sulphuric acid. Following

the stripping of the tin the base metal should be dipped in the conventional bright dip of nitric and sulphuric acid and properly rinsed before it is replated.

The advantage of this stripping method is that the base metal is not attacked appreciably except when copper nitrate is used and that it is reasonably fast. The cost of the stripping solution is low. This method also eliminates completely any scrap from too long an immersion in the stripping solution since the attack on the base metal is negligible except when copper nitrate is used. The dilute sulphuric acid does not attack copper much because any such attack forms a loose protective coating over the surface of copper.

While this process is primarily intended for the stripping of tin from copper and copper alloys it may also be used for stripping zinc, antimony, cadmium, silver and molybdenum from copper and copper alloys and steel.

While the form of embodiment of the invention as herein disclosed constitutes a preferred form, it is to be understood that other forms might be adopted as may come within the scope of the claims which follow.

What is claimed is as follows:

1. The process of stripping tin from metal containing a substantial proportion of copper which includes immersing the tin coated metal containing copper in a dilute sulphuric acid solution containing as the essential ingredient copper ions in the amount of 28 to 56 grams per liter for a period of time sufficient to strip the tin from the metal.

2. The process of stripping tin from metal containing a substantial proportion of copper which includes removing any organic material if any which may be covering the tin, immersing the tin coated metal containing copper in a dilute sulphuric acid solution containing as the essential ingredient copper ions in the amount of 28 to 56 grams per liter for a period of time suffcient to strip the tin from the metal and then immersing the metal in a bright dip solution containing nitric and sulphuric acids.

3. The process of stripping tin from metal containing a substantial proportion of copper which includes immersing the tin coated metal containing copper in an aqueous sulphuric acid solution containing as the essential ingredient about 6% sulphuric acid by volume and copper ions in the amount of 28 to 56 grams per liter for a period of time substantially between ¼ and ½ minute for each .0001" thickness of the tin coating.

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