

The "Club Soda Formula"

The Use of Magnesium Bicarbonate Prepared with Magnesium Hydroxide and Club Soda to Protect Paper Against Aging

The most important step that an individual can take to reduce the rate at which his records are aging is to neutralize and impregnate them with an alkaline buffering agent to prevent reacidification. Methods for deacidifying paper include treatment with aqueous and nonaqueous solutions as well as alkaline gases.

Aqueous (water-based) deacidification solutions using calcium bicarbonate or magnesium bicarbonate are good choices when the cost of labor is less important than the cost of chemicals, and when the article being treated will not be harmed by water or by handling when wet.

The protection of paper using this solution of magnesium bicarbonate in club soda was originally developed by Dr. Richard D. Smith, President of Wei T'o Associates, around 1966. He has made it freely available on a noncommercial basis since that time. This treatment will deacidify acidic papers, even newspapers, deposit a substantial quantity of alkaline buffering agent, inhibit the catalytic action of trace metals, and tend to prevent the development of foxing. Although it is a convenient and useful method, if much aqueous deacidifying is to be done, better results can be obtained by putting the carbon dioxide into solution using a seltzer bottle instead of the club soda.

Materials

1. One quart of club soda or sparkling water
2. Magnesium hydroxide, technical or reagent grade (available locally from chemical or laboratory supply houses, or by mail order from Talas, 104 Fifth Ave., New York, NY 10011)
3. A plastic, aluminum, enameled, glass, or stainless steel pan measuring about 1" x 12" and 2" deep
4. White blotting paper (from a stationery store or Talas)
5. Paper towels

Preparing the Solution

Care should be taken to use fresh magnesium hydroxide because it has better solubility. Wet two teaspoonfuls of magnesium hydroxide with one or two ounces of cold club soda or water and mix until lumps disappear. Pour or spoon the slurry back into the bottle. Replace the cap and shake gently to thoroughly disperse the slurry. Replace the bottle in the refrigerator and keep it there because a stronger solution is produced with cold club soda. After ten, twenty, and thirty minutes, take out the bottle and shake it gently to redisperse the undissolved white powder. Continue shaking every ten minutes until essentially all of the magnesium hydroxide is dissolved. Then allow the bottle to sit quietly in the refrigerator for 30 minutes or until the undissolved powder settles to the bottom of the bottle.

Treatment Procedure

Colors and inks used on the paper should first be tested to make sure they will not run, by moistening an inconspicuous part, waiting five minutes (remoistening as necessary), then

blotting the moisture with a white Kleenex, on which a stain will appear if the inks are not colorfast.

Pour the clear solution of magnesium bicarbonate in club soda carefully into the pan, previously cooled in the refrigerator. Place the papers to be treated into the solution one by one. Weak and embrittled sheets can be protected by handling them individually on sheets of strong paper or plastic, or on an aluminum or plastic screen. Press each sheet gently into the solution to insure that it is thoroughly immersed before the next sheet is added. Soak up to 25 8 x 11 sheets of paper in this solution for at least 30 minutes. Soaking for 1 or 2 hours normally is not harmful. Raise and lower the sheets gently 3 or 4 times to facilitate contact with fresh solution. Remove the sheets from the pan after treatment and allow the excess solution to drain away. Discard the solution remaining in the pan, Dry the sheets in the air on paper towels until the paper is just damp. Then place them one by one between sheets of blotting paper. Continue drying under moderate pressure (several heavy books), changing blotters when necessary, until the treated sheets are flat and dry.

(Note: an earlier version of the formula used magnesium carbonate. Magnesium hydroxide dissolves faster and produces stronger solutions.)

Since the dry magnesium hydroxide or magnesium carbonate from which the solution is made ages and does vary in quality and solubility, it is a good idea to test the prepared solution to see if it has turned out to be strong enough. A low-cost test kit has been prepared for this purpose by Taylor Chemicals, Inc. at Dr. Smith's request. It costs about \$5.35 plus postage and can be ordered direct from Taylor Chemicals, Inc., 7300 York Rd., Baltimore, MD 21204. Ask for the "Taylor Special Magnesium Carbonate Drop Test Kit #1597".