The Preparation of Zeolytic Water Softening Materials

Eston L. Barthel
ACTION OF THIONYL CHLORIDE ON DIACETONE-GLUCOSE

JAMES B. ALLISON

Diacetone-glucose was treated with thionyl chloride in hopes of replacing the free hydroxy group by chlorine. The sodium salt of diacetone-glucose (and other diacetonehexoses) in inert solvents, reacts instantaneously with thionyl chloride. The reaction product is apparently the di-(diacetone-glucose)-ester of sulfurous or sulfonic acid. One fraction has been obtained crystalline but no analysis was attempted due to the small yields. The product reacts with hydrazine to form the 3-hydrazino-diacetone-glucose which would indicate a structure analogous to that of the 3-toluolsulfono-diacetone-glucose.

OBSERVATIONS ON THE NUTRITIVE VALUE OF SKIMMED MILK POWDER

L. T. ANDEREGG

Diets containing skim milk powder as the source of protein and vitamins other than A, produce results different from comparable diets made up from whole milk powder. Growth is about normal or may be better than normal. Reproduction and rearing of young is not normal. There are few or no litters, and the young almost invariably die. The period of producing the first litters may be much delayed. Addition of yeast or wheat embryo has resulted in normal growth and in the normal rearing of the first litters of young. The second generation rats are growing normally and appear to be in fine condition due to these supplements.

THE PREPARATION OF ZEOLYTIC WATER SOFTENING MATERIALS

ESTON L. BARTHIEL

Raw untreated green sand is very colloidal and has little or no water softening power. By heating the green sand to 400°C and subsequently treating it with a salt (NaCl) solution, a stable zeolitic sand is obtained which has good water softening power.
This method is in actual use at the present time. It has been found that by modifying this treatment a zeolite with greater water softening power is obtained. The sand is first treated with a concentrated calcium chloride solution, and subsequently with a concentrated sodium chloride solution. The sand is then rapidly heated to a temperature of about 800°C and is then quenched in a salt solution.

A COMPARISON OF GRADES IN CHEMISTRY WITH THE SAME AND WITH DIFFERENT INSTRUCTORS

F. E. BROWN AND KENNETH L. BIRD

An analysis of 10453 enrollments in freshman chemistry was made. Of these 3648 had the same instructor in recitation and laboratory, and 6805 had different instructors. 5.4% of those having the same instructor failed; 8.3% of those having different instructors failed. 3.1% of those having the same instructor received a grade of 95% or above; only 1.9% of those having different instructors received a grade of 95% or above. Taking 80% as the dividing point, of those having the same instructor 41.6% were below and 58.4% above. Of those having different instructors 48.9% were below 80% and 51.1% above. The test and final examination grades are not so uniform as these final grades but in general the better grades are received by those who have the same instructor in recitation and laboratory.

SPONTANEOUS DECOMPOSITION TEMPERATURES OF POTASSIUM CHLORATE—IRON OXIDE MIXTURES

F. E. BROWN AND W. C. O. WHITE

Potassium chlorate and the oxides of iron were mixed in varying proportions and the spontaneous decomposition temperatures of the mixtures determined. \( \text{Fe}_3\text{O}_4 \) prepared at high temperatures exerted very little catalytic effect and no rapid evolution occurred below 374° in a mixture whose composition was \( \text{KClO}_3 : \text{Fe}_3\text{O}_4 :: 1 : 1 \). A monohydrate of \( \text{Fe}_3\text{O}_4 \) prepared by precipitation was magnetic as precipitated. A 1:1 mixture of this oxide with \( \text{KClO}_3 \) suffered spontaneous decomposition at 294°. A freshly prepared sample of \( \text{Fe}_3\text{O}_4 \) was used with \( \text{KClO}_3 \). Spontaneous decomposition occurred at 235°. A sudden evolution of \( \text{Cl}_2 \) occurred at 120°. The \( \text{Cl}_2 \) evolved at 120° was from \( \text{NH}_4\text{Cl} \).