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REMOVAL OF METHYLENE BLUE FROM ACETANILIDE BY NORIT A

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Charcoal is commonly used in the purification of organic compounds by crystallization. Descriptions of the techniques used sometimes call for "a small amount of charcoal," and often there is a caution against using too much. In some cases the amount of charcoal is described in terms of the weight of solid to be purified, or the volume of the crystallizing solvent.

This report deals with a study that was made of the amounts of Norit A decolorizing carbon required to remove methylene blue from acetanilide, using water as the crystallizing solvent. Seven mixtures were prepared, containing 0.050 g, 0.100 g, 0.200 g, 0.300 g, 0.400 g, 0.500g and 0.600g of methylene blue per 100 g of acetanilide. These were identified as Numbers 1/2, 1, 2, 3, 4, 5 and 6, respectively. Each was thoroughly pulverized to give a homogeneous mixture.

Three gram samples of each of these mixtures were treated with varying amounts of Norit A in the following manner: 3 g of the mixture and ml of distilled water were placed in a small be covered with a watch glass and heated until mixture dissolved. The weighed amount of N A was added and the mixture boiled for 5 min and then filtered through a pre-heated Buc funnel. The residue of Norit A was washe breaking the partial vacuum, covering the re with 10 ml of hot water and applying suction. combined filtrate was allowed to cool to room perature. The acetanilide that crystallized filtered with suction and washed with 15 m cold water. The crystals of acetanilide were all to dry and compared, by visual inspection, w colorless sample of acetanilide that had bee colorized with a large excess of Norit A.

At least 4 samples were run on each mi with the amount of Norit A being increase 0.025 g from one sample to the next. These sa included the one with the maximum amou Norit A that did not remove all color, an one with the minimum amount that did. It m be noted that the filtrates from the colorles tanilide crystals were somewhat blue, indic that all of the methylene blue had not bee sorbed.

Table 1 gives (a) the mg of methylene

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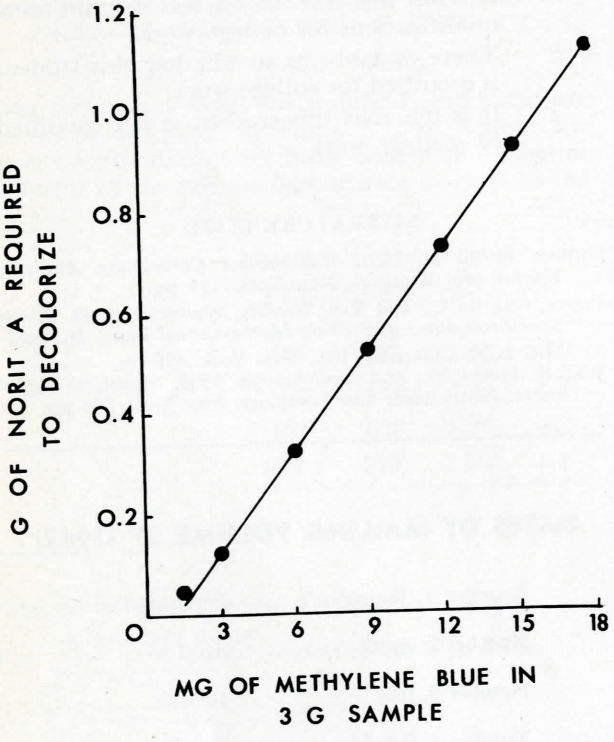

Fig. 1

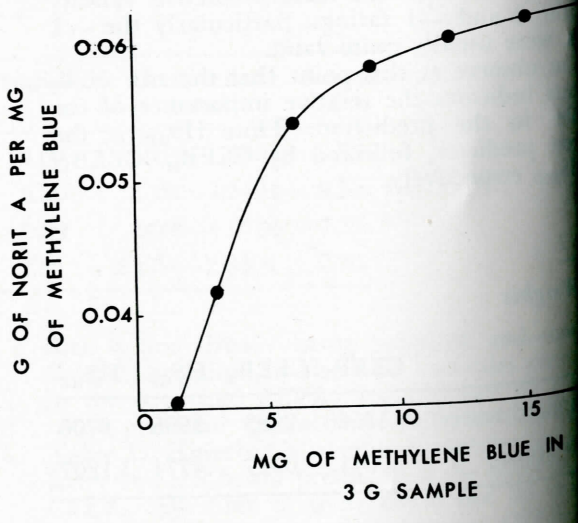

Fig. 2

TABLE I

Mixture number	(a) mg of methylene blue in 3 g sample	(b) g of Norit A required to decolorize	(c) g of Norit A per mg of methylene blue
½	1.5	0.050	0.033
1	3.00	0.125	0.0417
2	6.00	0.325	0.0542
3	9.00	0.525	0.0583
4	12.0	0.725	0.0604
5	15.0	0.925	0.0617
6	18.0	1.125	0.0625

in a 3 g sample of each mixture, (b) the minimum amounts (to the nearest 0.025 g) of Norit A required to give colorless crystals of acetanilide, and (c) the grams of Norit A per mg of methylene blue — (b) ÷ (a). These data show, within the limits of the techniques used, that beginning with mixture No. 1, (1) an increase of 3 mg of methylene blue required 0.2 g more Norit A to give colorless crystals, and (2) the amount of Norit A required to remove 1 mg of methylene blue increased at a diminishing rate as the amount of methylene blue increased.

Figure 1 is a plot of grams of Norit A required to give colorless acetanilide crystals *vs* milligrams of methylene blue in a 3 gram sample — column (b) *vs* column (a). Figure 2 is a plot of grams of Norit A per milligram of methylene blue *vs*. milligrams of methylene blue in a 3 gram sample — column (c) *vs* column (a).

Other studies of the adsorption of methylene blue from solution by charcoal are described in references 1, 2, 3 and 4.

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NEWS OF TENNESSEE SCIENCE

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blanks will be mailed to Southeastern colleges in January or may be obtained by writing Dr. Isabel Tipton, Department of Physics, University of Tennessee, Knoxville, Tennessee.

High school mathematics teachers will have an opportunity to do graduate study at the University of Tennessee in the third Summer Institute for Mathematics Teachers under a $62,500 National Science Foundation grant. The eight-week institute begins June 10, 1963, and is open to junior and senior high school teachers currently teaching mathematics. Each participant will receive $600 plus dependent and travel allowances for study at the institute.

According to Dr. Edgar D. Eaves, U-T mathematics professor and director of the institute, the topics to be taught will be subject matter courses including basic calculus, projective geometry, logic and sets, the real number system, and seminar courses in high school geometry and algebra. All courses are acceptable as credit toward a master's degree in mathematics. Applicants should have had previous study in analytical geometry and, preferably, calculus. They must be eligible for admission to the Graduate School of the University of Tennessee, have had at least two years of teaching experience, and be planning to continue teaching mathematics at the secondary level. Selection of participants will be made on the basis of their teaching assignments, previous mathematics training, potential for future service in teaching, and ability to benefit from the institute.

For additional information and application blanks write Dr. Edgar D. Eaves, Department of Mathematics, University of Tennessee, Knoxville.

Construction will begin early in 1963 on an addition to Hesler Biology Building on the Knoxville campus, University of Tennessee.

The addition will be devoted entirely to research facilities in connection with the Departments of Bacteriology, Botany, Zoology, Entomology and Biochemistry. The National Science Foundation has just granted U-T $425,400 to bear a part of the cost of the research structure. The addition will be built on the southeast end of Hesler Biology Building facing the new million-dollar Physics Building just opened this year. It will become a part of the growing science and engineering complex developing on "The Hill." Six stories high with approximately 6,000 gross square feet of floor space in each, the research structure will be fireproof and completely air conditioned.