

stance with finely powdered silica. The silica not only prevents an explosion, but also materially assists in reducing the oxides of nitrogen formed.

INORGANIC CHEMISTRY.

HENRY FAY, REVIEWER.

On the Isomorphism of Selenium and Tellurium. BY JAMES F. NORRIS AND RICHARD MOMMERS. *Am. Chem. J.*, 23, 486-494.—The isomorphism of the double bromides of selenium and dimethylamine with the corresponding tellurium compound was studied by bringing together in succession saturated solutions of these two colored salts with the colorless double chloride of tellurium and dimethylamine. According to the method of Retgers, isomorphism exists when the color of the crystals varies gradually from one side to the other, the crystals of the pure compounds being visible on the extreme edges of the mass. If, however, the salts are not isomorphous, they do not mix, and in the center where the two solutions have been brought together, distinct crystals of each compound may be seen, owing to their difference of color. The double chloride of tellurium and dimethylamine gave mixed crystals of varying depths of color with both the selenium and the tellurium double bromide, showing the isomorphism of both bromides with the chloride, and consequently with each other. As it has been suggested that tellurium salts are isomorphous with those of the platinum group of metals, the double bromide of platinum and dimethylamine was tested in the same manner, using again the double chloride of tellurium and dimethylamine. In this case the two compounds crystallized out separately, disproving the isomorphism of the platinum compound with those of selenium and tellurium. During the investigation the following double salts of tellurium were isolated: $3\text{TeCl}_4 \cdot \text{TeOCl}_2 \cdot 4(\text{CH}_3)_2\text{NH} \cdot \text{HCl} \cdot \text{H}_2\text{O}$, $\text{TeCl}_4 \cdot \text{TeOCl}_2 \cdot 2(\text{CH}_3)_2\text{NH} \cdot \text{HCl} \cdot \text{H}_2\text{O}$, $\text{TeCl}_4 \cdot 2\text{TeOCl}_2 \cdot 3(\text{CH}_3)_2\text{NH} \cdot \text{HCl}$, $\text{TeCl}_4 \cdot 2(\text{CH}_3)_2\text{NH} \cdot \text{HCl}$, $\text{TeBr}_4 \cdot 2(\text{CH}_3)_2\text{NH} \cdot \text{HBr}$. It is thus shown that tellurium, as well as selenium, forms double salts which contain the oxychloride of the metal. The first three salts can be considered as derivatives of the salt $\text{TeCl}_4 \cdot (\text{CH}_3)_2\text{NH} \cdot \text{HCl}$, in which a part of the tellurium tetrachloride has been converted into the oxychloride by the water in the solvent. Double salts of tellurium, analogous to the double salts of selenium and the perbromide of dimethylamine $(\text{CH}_3)_2\text{NH} \cdot \text{HBr}_2$, could not be obtained.

The Occurrence of Vanadium, Chromium, and Titanium in Peats. BY CHARLES BASKERVILLE. *J. Am. Chem. Soc.*, 21,

706.—In the ash from three samples of peat, all presumably from Hyde Swamps, N. C., small quantities of titanium, chromium, and vanadium were found.

A Study of Certain Double Chromates. BY W. G. HAYWOOD. *J. Elisha Mitchell Sci. Soc.*, 16, 56–59.—By crystallizing solutions of the alkali carbonates with the alkali bichromates, the following salts were isolated: $\text{NaNH}_4\text{CrO}_4 \cdot 2\text{H}_2\text{O}$, $2\text{Na}_2\text{Cr}_2\text{O}_7$, $(\text{NH}_4)_2\text{CrO}_4 \cdot 4\text{H}_2\text{O}$, $3\text{K}_2\text{CrO}_4 \cdot \text{Na}_2\text{CrO}_4$, $\text{K}_2\text{CrO}_4 \cdot \text{MgCrO}_4 \cdot 2\text{H}_2\text{O}$. The properties of these salts were not studied.

On the Effect of Very Low Temperatures on the Color of Compounds of Bromine and Iodine. BY J. H. KASTLE. *Am. Chem. J.*, 23, 500–505.—In a previous paper (*this Rev.*, 6, 62) the author has shown that the color intensity of the halogens is in inverse ratio to their chemical activity, and that the halogen compounds which are least stable are the most highly colored. It was then assumed that the color of these compounds was due to dissociation. This idea is considered to be confirmed by the experiments described in the present paper. The following compounds were subjected to a temperature of -190° in a Dewar tube immersed in liquid air: Lead iodide, phosphorus pentabromide, phosphorus heptabromide, mercuric bromide, iodoform, benzene, dibromsulphonamide, tribromphenol bromide, and mercuric iodide. In each case the color of the compound became markedly lighter on cooling, the change being, in some cases, very decided. It would seem to be generally true that all colored substances become lighter on cooling to low temperatures, but the change of color cannot be due in all cases to the same causes which produce it in the bromides and iodides. By cooling simultaneously the yellow and red varieties of mercuric iodide, it was found that the yellow mercuric iodide became white or very pale yellow, and that the red changed to orange-yellow, from which facts the author concludes that the low temperature does not change the red variety to the yellow variety stable above 128° , but simply changes its color in a manner characteristic of other colored bromides and iodides.

On the Supposed Allotropism of Phosphorus Pentabromide. BY J. H. KASTLE AND L. O. BEATTY. *Am. Chem. J.*, 23, 505–509.—It has been found that the red crystals which have been supposed to be an isomeric form of phosphorus pentabromide are in reality phosphorus heptabromide. The two substances behave differently towards water. The yellow phosphorus pentabromide, when brought in contact with water, changes to the oxybromide and afterwards dissolves. The red heptabromide dissolves apparently without the production of the oxybromide

and gives a solution which has the color of bromine water, the color of which can be removed by carbon disulphide. It is further shown that heat is evolved when bromine is added to phosphorus pentabromide, and that by adding a small quantity of phosphorus tribromide to the red compound it is changed to the yellow compound according to the equation $PBr_7 + PBr_3 = 2PBr_5$. Phosphorus heptabromide has been obtained in the form of bright red, transparent, prismatic crystals which may be resublimed, but which give up bromine on standing in contact with bromine absorbents.

Notes on Gold-Sodium Chloride. BY LYMAN F. KEBLER. *J. Franklin Inst.*, 150, 235-237.—The following varying percentages of gold have been found in five samples of commercial gold-sodium chloride: 21.29, 24.68, 26.13, 29.02, 32.91.