Irregular.

Irregular indicates that at times the bird may be Common and at other times Rare. Often this has to be used in connection with one of the other seven terms. In such cases it is often necessary to add Usually; as: Crossbill, Irregular, Usually Rare.

Of course it is not intended that these terms should always be used by themselves. One may use them, when necessary, in conjunction with other words; as, Common Migrant, Scarce Resident, etc.

JOHN DRYDEN KUSER

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TRIVALENT PLATINUM

THE first evidences of the existence of compounds in which platinum acts with a valence of three were found about two years ago by Wöhler. On carefully chlorinating $PtCl_2$ or dechlorinating $PtCl_4$ at 390°, a greenish-black powder was formed which had the formula $PtCl_3$. This dissolved slightly in cold water, but more rapidly in hot, with the formation of an acid, H_2PtCl_3O, some hydrolysis also taking place. By precipitating with soda, a pure hydrated sesquioxid was obtained, but this could not be dehydrated without decomposition. When the hydrate was dissolved in acid a mixture of chloroplatinous and chloroplatinic acids was formed. Wöhler found, however, that when a dilute solution of cesium and a mixture of chloroplatinous and chlororin water, a dark-green powder is precipitated, of the composition Cs_2PtCl_5, which has a strong tendency to decompose into the chloroplatinite and chloroplatinate.

This work has been strikingly confirmed in a paper read by Levy before the Chemical Society (London) on March 25. Levy was working on the copper-red iridescent salt, discovered by Hadow, which is formed when chlorin or bromin is added to a solution of potassium cyanoplatinite. To this Hadow gave the composition of $5K_2Pt(CN)_4 \cdot K_2Pt(CN)_4 \cdot Br_2$. The character of the salt Levy confirmed, but its formula should be $6K_2Pt(CN)_4 \cdot K_2Pt(CN)_4 \cdot Br_2$. Levy also found that when the cyanoplatinite is oxidized by lead or manganese dioxid in the presence of sulfuric acid, a similar compound is formed, but containing SO_4 instead of Br_2, which behaves like the sulfate of a feebly electropositive element; in other words the group $(7K_2Pt(CN)_4)$ acts like a bivalent positive ion. More interesting was the result when hydrogen peroxid and other peroxids were used as the oxidizing agents. With the potassium cyanoplatinite there is at once formed a well-defined, crystallized double salt of the composition $3K_2Pt(CN)_4 \cdot KPt(CN)_4 \cdot 6H_2O$, which is not further acted on by hydrogen peroxid. When, however, perhydrol is used the oxidation to $KPt(CN)_4$ is complete, and a series of similar salts was prepared. With the free cyanoplatinous acid, $H_2Pt(CN)_4$, the oxidation to $HPt(CN)_4$ by hydrogen peroxid is complete. Here we have an acid and its salts in which the platinum acts, as in Wöhler's halid salts, as trivalent, and its formula may be written $HCN \cdot Pt(CN)_3$. These cyanoplatinates would bear the same relation to the cyanoplatinites as the ferrocyanids bear to the ferricyanids. This is unexpected, as it would naturally be inferred that in accordance with the analogy furnished by the haloplatinites and haloplatinates, the cyanoplatinates would have the formula $M_2Pt(CN)_6$. No evidence was found of similar compounds of the type $2MCN \cdot Pt(CN)_3$ or $3MCN \cdot Pt(CN)_3$. On treatment with KCN or with any alkali, decomposition ensued, with the regeneration of the cyanoplatinite.

J. L. H.

SPECIAL ARTICLES

SIMPLE DEMONSTRATION APPARATUS FOR THE INFRA-RED SPECTRUM

MOST teachers of experimental physics in this country do not attempt to illustrate the optical properties of matter in the long wavelength invisible spectrum, for the reason that the standard detecting instruments, the bolometer, thermopile, radiometer or radiomicrometer, are not particularly well suited for use in the lecture room where great stability is not usually ensured. Moreover, unless the lec-