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The 1,2,3,4-tetrahydro-isoquinolin-4-one **4** reacts as an α-amino ketone with periodate to give various products, the major compound being 1-hydroxy-1,2-dihydro-3,4-isoquinolinedione **12**. Upon stepwise oxidation with Hg(II)-EDTA the 4-hydroxyisoquinolinium ion **14** is detected as an intermediate and its further oxidation with periodate gives rise to an almost identical product spectrum. Because **12** represents a carbinolamide with an additional 4-carbonyl group, this type was examined first. Acid catalysis was used because the reactive species mostly are iminium ions. With cyclic 1,3-dicarbonyl compounds, 1-substituted derivatives **17a**, **b** are formed. With linear species 1-substitution is also observed, but the tautomeric forms **19a** – **c** are obtained. The stable enones **24a**, **b** result from alkyl ketones by ready autoxidation of the primary products. Base catalysis induces a ring contraction of **12** to the hydroxycarboxylic acid **25**. Reaction of **12** with aniline and phenylhydrazine yields the easily oxidizable 1-substitution products **28** and **31**.

Key words: Periodate, Hydroxyisoquinolinium Salt, Hg(II)-EDTA, *N*-Acylcarbinolamine