Kinetics and mechanism of oxidation of chondroitin-4-sulfate polysaccharide by chromic acid in aqueous perchlorate solutions

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Abstract:

The kinetics of chromic acid oxidation of chondroitin-4-sulfate polysaccharide as sulfated carbohydrates at a constant ionic strength of 4.0 mol dm$^{-3}$ has been investigated, spectrophotometrically. The reaction kinetics showed a first-order dependence in chromic acid and fractional-first-order kinetics with respect to the chondroitin-4-sulfate concentration. The influence of [H$^+$] on the reaction rates showed that the oxidation process is acid-catalyzed. Added Mn$^{2+}$ ions indicated the formation of Cr(IV) as intermediate species. A kinetic evidence for formation of 1:1 intermediate complex was revealed. The kinetic parameters have been evaluated and a tentative reaction mechanism in good consistent with the kinetic results obtained is discussed.

Keywords:

Chondroitin-4-sulfate Polysaccharides Chromic acid Catalysis Oxidation Kinetics Mechanisms Separation

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