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Diperiodatoargentate(III) oxidation of D-galactose in absence and presence of anionic and cationic surfactants

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Abstract

Diperiodatoargentate(III) (DPA) was used as an oxidizing titrant in the spectrophotometric degradation of D-galactose for the first time. The kinetics is based on the reduction of silver(III) to silver(I) by D-galactose at specified experimental conditions. Effects of added [H⁺] and [periodate] have also been investigated. The premicellar environment of cetyltrimethylammonium bromide (CTAB) and sodiumdodecyl sulphate (SDS) strongly inhibits the reaction rate. The observed rate constant is strongly affected by [CTAB] and [SDS] changes for [surfactant] <cmc. Surfactant concentration range above the cmc does not influence the reaction rate. The monoperiodatoargentate(III) ions act as an active oxidant in comparison to that of DPA. A suitable mechanism involving a two-electron transfer from D-galactose to the silver(III) species has been proposed and hence a corresponding rate equation has been derived. © Taylor & Francis Group, LLC.

Author Keywords

CTAB; D-galactose; Diperiodatoargentate(III); Reduction; SDS