Ahmed A Abdel-Khalek et al., J Pharma Care Health Sys 2015, 2:4
http://dx.doi.org/10.4172/2376-0419.S1.006

OMICS International
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European Pharma Congress

August 25-27, 2015 Valencia, Spain

Kinetic and mechanistic study of chromium (III) complex involving anti-Parkinson drug (Carbidopa) with N-bromosuccinimide

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Kinetics of oxidation of [CrIII(CD)(H2O)52+] (CD=Carbidopa) with N-bromosuccinimide (NBS), was studied in an aqueous solution over ranges of complex and NBS concentrations of (1.0-5.0)×10-4 mol.dm-3 and (0.5-5.0)×10-2 mol.dm-3, respectively; 0.2-0.3 mol.dm-3 ionic strength and 30-50 ˚C. The product of oxidation was examined using High Performance Liquid Chromatography (HPLC) technique, reversed-phase partition mode. The reaction is first-order with respect to [CrIII(CD)(H2O)52+] and [NBS]. The reaction rate increases with increasing pH values over the range studied. Thermodynamic activation parameters were calculated. Oxidation of [CrIII(CD)(H2O)52+] by [NBS] found to obey the rate law d[CrVI]/dt=d[CrVI]/dt={k5[MnII]+(k4+k3/[H+])[NBS]}×[CrIII(CD)(H2O)5]. It is assumed that one step two-electron transfer takes place via an inner-sphere mechanism. A common mechanism for this reaction is proposed. With patients who administer anti-Parkinson drug (CD), formation of [CrIII(CD)(H2O)52+] *in vivo* can be expected due to CrIII is taken as a natural food element. So, this work provides an opportunity to identify the nature of such interactions *in vivo* similar as *in vitro.*

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