DCC-27 (Univ. Zagreb)

Croat. Chem. Acta **40** (1968)

Polarographic Investigations of Metal Complexes in Monochloroacetic Acid

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The stability consts. of complexes of Pb, Cu, Cd, and Zn with monochloroacetate ion were detd. using the polarographic method. Investigations were made in buffer solns. of sodium monochloroacetate and monochloroacetic acid. It was found that the half-wave potential of metal ion was shifted to more positive values with the increase of the concn. of monochloroacetic acid, this being just the opposite effect to the shift of the half-wave potential due to the complex bond.

The stability consts. of the complexes detd. by the graphical method of DeFord and Hume, were: Pb: $\beta_1 = 31$, $\beta_2 = 30$, $\beta_3 = 170$; Cu: $\beta_1 = 12$, $\beta_2 = 26$, $\beta_3 = 4$, $\beta_4 = 27$; Cd: $\beta_1 = 8$, $\beta_2 = 3$, $\beta_3 = 6$, $\beta_4 = 8$; Zn: $\beta_1 = 2.4$, $\beta_2 = 1.8$, $\beta_3 = 0.6$.

The increasing stability of monochloroacetato complexes in the series: Zn, Cd, Cu, Pb is interpreted as due to higher polarisability of the central ion.

Examiners: Prof. I. Filipović, Prof. V. Krajovan-Marjanović, and Prof. S. Žilić

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Cadmium
Chloroacetic acid, mono-
Complexes
Copper
Lead
Polarography
Stability constants
Zinc

DCC-28 (Univ. Zagreb)

Croat. Chem. Acta **40** (1968)

Investigations on the Complexes of Cobalt, Nickel, and Zinc in Buffer Solutions of Glycolic and β-Hydroxybutyric Acid

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The stability consts. of cobalt (II), nickel (II), and zinc (II) glycolato and β-hydroxybutyrato complexes have been detd. by potentiometric measurements of *p*H changes according to Bjerrum and Fronaeus (*cf. CA* **35**, 6527). Values found were: glycolato complexes: Co, $\beta_1 = 24.8$; Ni, $\beta_1 = 55.8$; Zn, $\beta_1 = 58$, $\beta_2 = 610$; β-hydroxybutyrato complexes: Co, $\beta_1 = 27$, $\beta_2 = 821$; Ni, $\beta_1 = 36$, $\beta_2 = 10$, $\beta_3 = 2200$; Zn, $\beta_1 = 21$, $\beta_2 = 150$, $\beta_3 = 180$, $\beta_4 = 4778$.

The increase of stability of the β-hydroxybutyrato complex in the sequence Zn, Co, Ni, and the fact that the nickel complexes are more stable than the cobalt complexes in both the investigated series, is in agreement with theoretical anticipations on the basis of the ligand field theory. The high stability of some complexes may probably be accounted for by a certain chelating effect. The chelating effect is most pronounced in the zinc glycolato complex, and the cobalt and nickel β-hydroxybutyrato complexes, in perfect accordance with their observed stability. That the glycolato complex is more stable than the β-hydroxybutyrato complex is a consequence of the more favorable α-position of the hydroxyl group in the mono-carboxylate ion, which is the matter of common knowledge in respect to these and analogous ligands.

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DCC-28

1. Investigations on the Complexes of Cobalt, Nickel, and Zinc in Buffer Solutions of Glycolic and β-Hydroxybutyric Acid

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Cobalt
Complexes
Glycolic acid
Hydroxybutyric acid, beta
Nickel
Potentiometric titration
Stability constants
Zinc

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