DISSERTATIONES

DCC-9 (Univ. Zagreb) 541.18.041:546.571.2

Croat. Chem. Acta **34** (1962)

The Co-precipitation of Silver Halides

B. Černicki

Laboratory of Physical Chemistry, Faculty of Science, University of Zagreb, Zagreb, Croatia, Yugoslavia

Ch. 1: The term co-precipitation, and the general feature of the phenomenon are defined. The definition is new and reasonably extended. Copptn. includes generally the formation of solid phase from soln. when at least two chemical formulae are needed for the description of the new phase. Copptn. may result in (*a*) adsorption compds., (*b*) mixed crystals, and (*c*) mixtures of crystals. Case (*a*) includes inner and surface adsn., case (*b*) classical and Grimm's isomorphy, case (*c*) simultaneous formn. of two or more solid phases from the same soln. It is recommended to abandon the terms occlusion and inclusion. A survey of copptn. processes is given, including the historical development of the investigations, the results of theory and experiment, and the application of copptn. in science and industry. Many phenomena, which are scattered through the papers under various terms, are given a common heading.

Ch. 2: The investigation of binary systems of silver halides is reviewed. The system AgBr-AgI was mostly treated because of its importance in photo-industry. Binary systems have been prepared by various methods and investigated by various techniques. The present author prepares them by copptn. in small concn. of electrolytes where only cryst. and not coagulation occurs.

Ch. 3: AgCN and AgSCN are added to silver halides as components of the binary systems, thus forming 10 systems. About 40 sols of each system have been prepared and studied tyndallometrically *in statu nascendi*. The method of Težak has been modified and the turbidity measured as a function of the concn. ratio of the components. As a result, certain indistinct phenomena have become measurable. The reproducibility tests have been satisfactory. The influence of temperature has also been measured. The sols (characteristic points on the tyndallograms) have been investigated by electron microscope. The exptl. results are illustrated by tyndallograms and electron micrographs.

Ch. 4: The exptl. results are discussed. The field investigated is linked with the pptn. of pure silver halides and with general problems of copptn. The concn. ratio of the components has essential influence on the formation of the solid phase. When turbidity is plotted against the concn. ratio of the components 3 types of functions may result: with remarcable extreme points, with approx. constant value, and with a continuous trend from the value of one component to that of the other one. As a consequence, several modes of the formation of the solid phase should be distinguished the indepedent crystn. of the components, the formn. of mixed crystals, the crystn. of the more soluble component on the less soluble core, the formation of two solid phases with different molar ratios.

Ch. 5: A short survey over the results in particular systems is given.

Parts of this Dissertation were published: *Croat. Chem. Acta* **29** (1957) 7, **30** (1958) 1, **30** (1958) 163.

Examiners: Prof. B. Težak, Prof. L. Filipović, Prof. M. Mirnik.

Oral Examination: February 1, 1962; *Degree conferred:* February 24, 1962.

Dissertation deposited at the University Library, Zagreb.

(172 pages, 81 figures, 260 references, original in Croatian)

B. ČERNICKI

DCC-9

541.18.041:546.571.1

1. The Co-precipitation of Silver Halides

I. Černicki B.

II. Laboratory of Physical Chemistry, Faculty of Science, University of Zagreb, Zagreb, Croatia, Yugoslavia

Binary systems
Co-precipitation
Silver Halides
Turbidimetry