

# Peculiarities of the Silver Chloride Stereostructures Photolysis

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## Abstract

The Conditions of nonequilibrium growth of the new forms of silver chloride microcrystals /MC/ - *stereostructures* are determined. The morphology of the stereo-structures was investigated by the method of the Electron Microscope Analysis, and also topography distribution of silver particles formed on a surface of stereostructures after photoexpose. At Exposure by the mercury lamp characteristic allocation of large particles of photolitic silver on local sites of a stereostructures surface has been found out.

## Introduction

In conditions of nonequilibrium growth the new forms MC AgCl are received which were named *stereostructures*.<sup>1</sup> The stereostructure represents a group of seven microcrystals one of which is located in the centre, and six others equally spaced from the central one. External MC are connected with central MC by crystals of the needle form, which represent branches of the first order of dendritic crystal. All seven structural elements of stereostructure have identical orientation in space. The size of stereostructures makes from 1 to 5  $\mu\text{m}$ . As a result of crystalization parameters varying 6 various morphological types of stereostructures, distinguished by the size of a central element in relation to external elements and length of a binding element, are received. The Study of stereostructures properties having the reference to photographic process allows to reveal those infringements of a crystal lattice in which photographic sensitivity is concentrated i.e. formation, nature and localization of intrinsic MC defects.

## Experimental

The stereostructures AgCl were received from a water solution  $\text{NH}_3$  in conditions of nonequilibrium growth when temperature, concentration of ions forming crystal, pH solution was varied. To research the Topography of photolitic silver allocation a series of experiments on Photolysis of stereostructures in the air and in vacuum was spent. The Exposure carried out by the mercury lamp changed exposition time from 30 to 60 mines and substrate temperatures from 25 to 200°C.

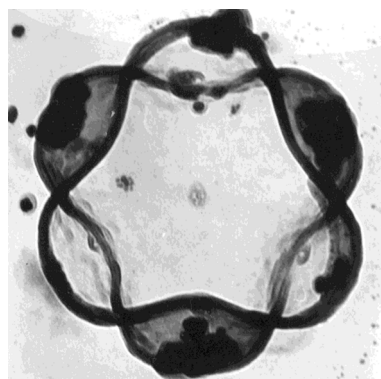
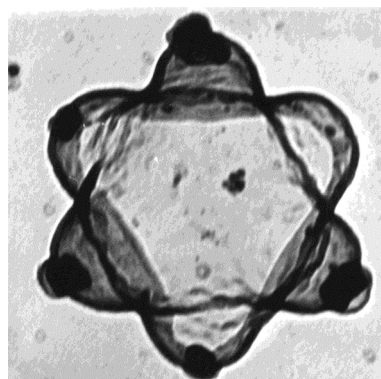
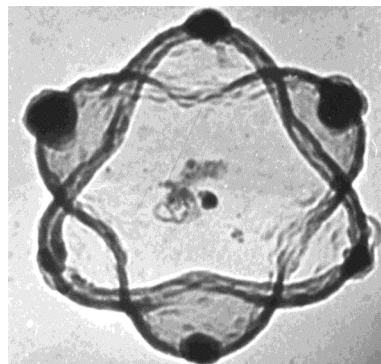


Figure 1. Electron micrographs of AgCl stereostructures Photolysis at exposition time - 40 mines and substrate temperature- 25°C.

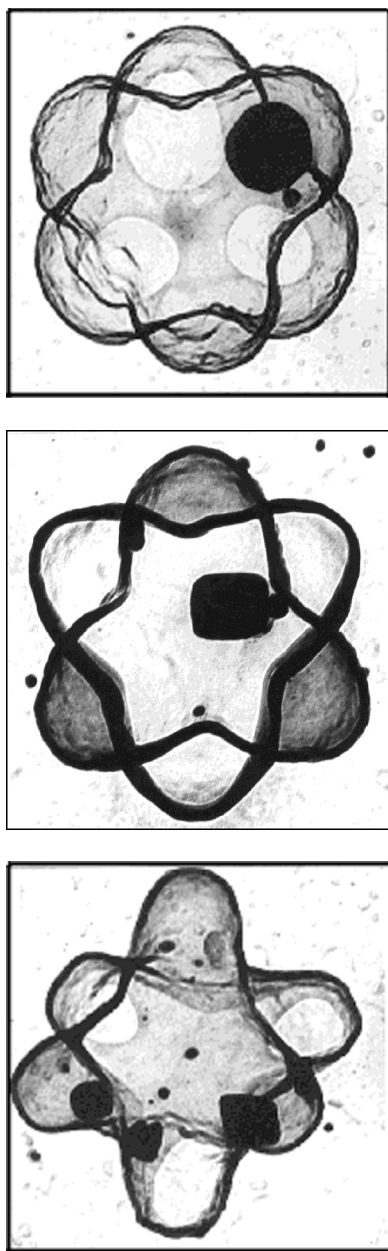


Figure 2. Electron micrographs of AgCl stereostructures Photolysis at exposition time -40 mines and substrate temperature -100°C.

Habit and surface structure of brought up microcrystals and also topography distribution of silver particles formed on a surface of Stereostructures after photo-expose was investigated by the transmission of electron microscopy method with the help of EM-125K using goniometer.

## Results

At Exposure of stereostructures in the air the size of particles of photolitic silver was small and its distribution on a MC surface had casual character. At Photolysis in vacuum increase of the particles size of photolitic silver depending on time of exposition and their various localization was observed. At optimum time of an exposition - 40 mines, the characteristic growth of 6 large silver particles on tops of six external elements of stereostructure was found out (see Figure 1). In this case the particles of photolitic silver had around form. The primary localization of allocation of photolitic silver was not observed at exposition time increase. As a result Photolysis during 40 mines, at temperature of a substrate 100°C the new character of photolitic silver distribution is revealed (see Figure 2). In this case a little (from 1 to 3) large photolitic silver clusters on an internal surface of stereostructures elements will be formed.

## Conclusions

Thus it is revealed, that there are the centres of high activity on a surface of silver chloride stereostructures on which the large Ag-clusters will be formed at Photoexposure.

## References

1. Kurakin S. I., Novikova L. A. Stereostructures of silver chloride microcrystals // IS&T's 48th Conference, Washington, May 7-11, 1995: Collect. Abstr. - Washington, 1995, P.285-286.