

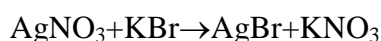
## DSCM 57P DEVELOPMENT OF PHOTOCHROMIC MICROSPHERES SANITIZED BY SOL-GEL METHOD

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Currently, there is the problem of creating optically transparent photochromic composite polymer-silicate materials with high working life at the sunlight. Two types of photochromic silicate microspheres size 100-300 microns synthesized by sol-gel method: spherical silica particles doped by photochromic nanoparticles (Fig. 1a) and photochromic particles coated silica (Fig. 1b). Tetraethylorthosilicate hydrolyzed in the presence of a catalyst - hydrochloric acid. The general that the reaction of a hydrolysis not a complete to finish. The partially hydrolyzed mixture is the main catalyst (ammonia or ammonium fluoride) for the gelation of the sol drops. [1] For giving the photochromic properties of the particles in the mixture is added freshly prepared colloidal sol of silver bromide. The chemical reaction producing the sol of silver bromide may be show as:



Thus, one of the substances ( $\text{AgNO}_3$  and  $\text{KBr}$ ) should be in excess, since these electrolytes are stabilizers  $\text{AgBr}$  particles, forming them on the electric double layer [2]. Formation of spherical microparticles due to the properties of the primary sol obtained at the optimum ratio of components and the initial temperature hydrolyzable solution and the degree of hydrolyzation solution and the amount of ammonium fluoride (ammonia) and water introduced into the sol.

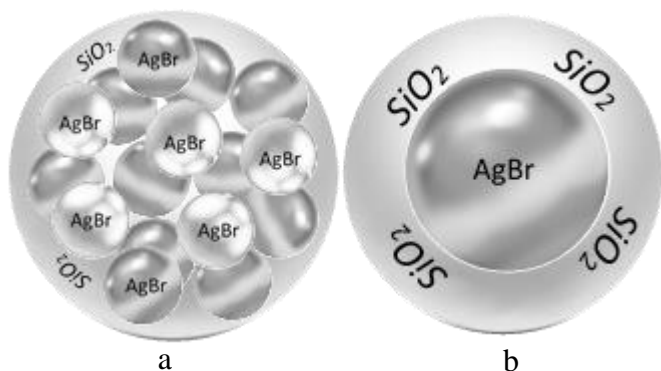


Fig. 1 – Scheme of photochromic microspheres sanitized by sol-gel method

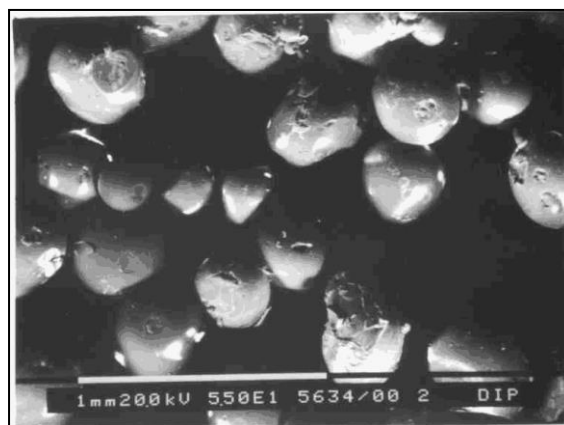


Fig. 2 – SEM of photochromic microspheres

Developed microspheres can be incorporate into a coating solution to obtain a photochromic coating on the glass.

[1] S.S. Voyutsky, Course of Colloid Chemistry. - Moscow: Chemistry, 1976. - 512 p.

[2] A process for producing spherical silica microparticles: Pat. 7542 Rep. Belarus, IPC 7 C 01B 33/18 / O.I. Tyulenkova, V.E. Gaishun, I.M. Melnichenko; appl. 20.10.1999; publ. 30.06.2001.