SYNTHESIS OF PIGMENTS BASED ON COBALT COMPOUNDS BY THE METHOD OF "GORENJE SOLUTE"

A. YU. NAZAROVA, O. V. LVOV, N. I. RADISHEVSKAYA

Tomsk Scientific Center SB RAS, Tomsk, Russia

The development of new effective inhibitory pigments is a promising direction in the field of anticorrosive paints. The new generation of such pigments currently being developed includes phosphates of nickel (II), manganese (II) and iron (II) with zinc oxide, slowing corrosion in 70-90% of cases. Recently, there has been a growing interest in energy-efficient technologies, such as "gorenje solute" (SGR). This approach is promising for the production of powdered materials, including those applied to a mineral base, due to the uniformity and fine dispersion of the resulting product [1 , 2].

The purpose of this work is to study the phase composition and structure of high-temperature inorganic pigments based on cobalt aluminophosphates obtained using the "solution combustion" method. Gorenje

Aluminum hydroxide $Al(OH)_3$, cobalt nitrate $Co(NO_3)_2 \cdot 6H_2O$, orthophosphoric acid H_3PO_4 (74%), boric acid H_3BO_3 qualification "hc", citric acid $C_6H_8O_7$ were used for synthesis. Marshalite SiO_2 and wollastonite $CaSiO_3$ were used as a substrate. The composition of the pigments was confirmed by X-ray phase analysis (DRONE-UM-1, filtered Co Ka radiation). The microstructure of the samples was studied using a Philips SEM 515 scanning electron microscope. The appearance of the X-ray curves of the cobalt-containing pigment indicates that the product is an X-ray amorphous material. Aluminum phosphates, boron and cobalt aluminophosphate crystallize at 700°C.

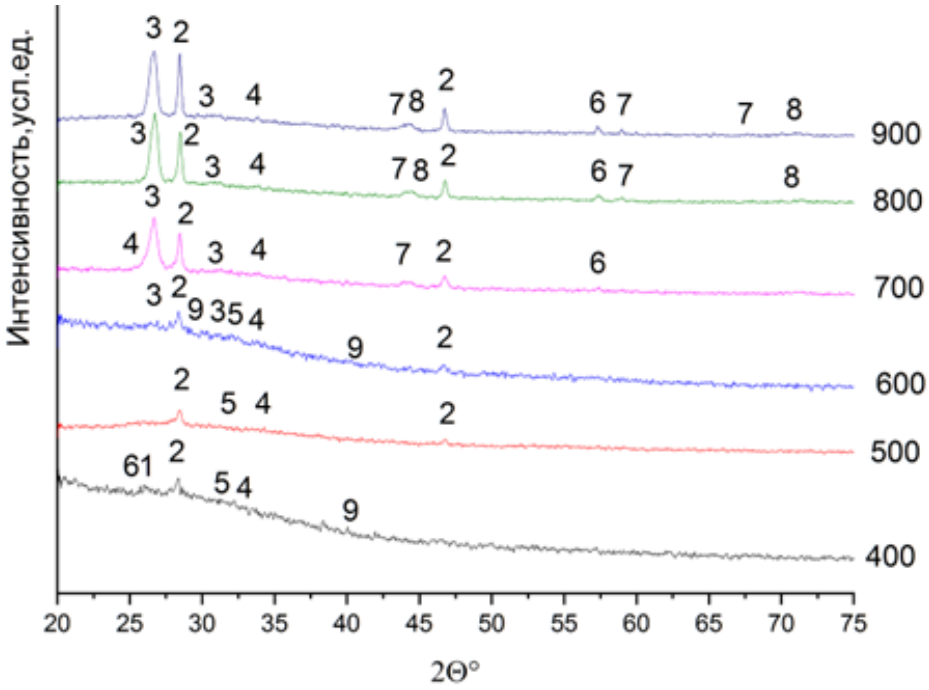

Fig.1. X-ray images of black pigment obtained by the SGR method and annealed at temperatures 400°C, 500°C, 600°C, 700°C, 800°C, 900°C, где 1-$Co_3(PO_4)_2$, 2-BPO_4, 3-$Al(PO_3)_3$, 4-$Al(PO_4)$, 5-$Al_{19,9}Co_{12,8}P_{32}O_{128}$, 6- CoP, 7-$CoP_3$, 8- CoP_4, 9-$3CoO \cdot P_2O_7$.

Impurities of cobalt phosphides formed during synthesis in a reducing medium give the pigment a black color and increase its anticorrosive properties. The application of phosphates to mineral substrates significantly reduces the cost of the resulting pigments. All pigments are temperature resistant 950°C.

REFERENCES

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