

IMPROVEMENT OF METHODS OF GERMANIUM DETERMINATION IN COALS, ORES AND INDUSTRIAL WASTE

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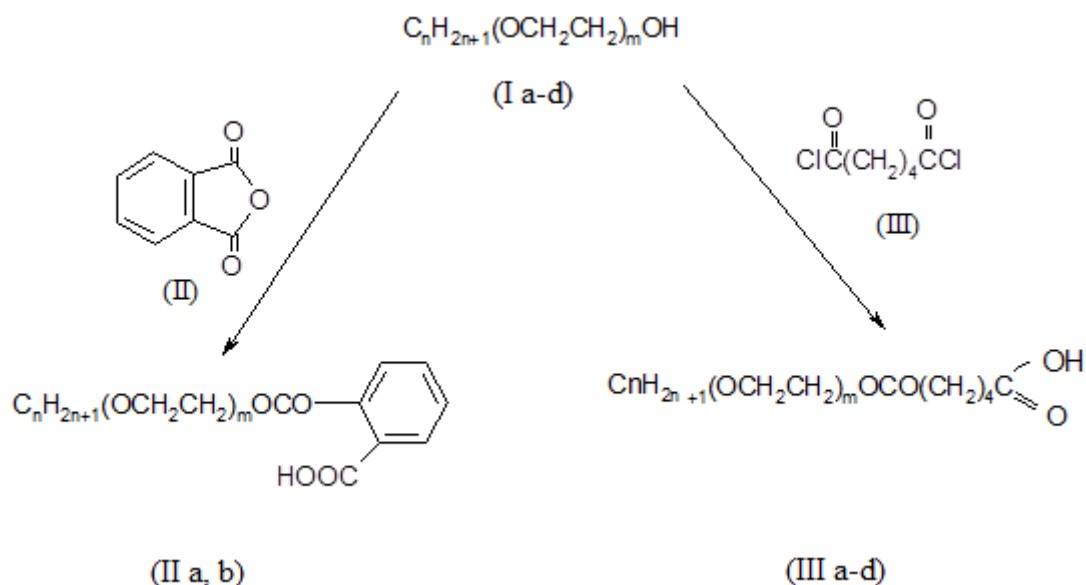
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In Ukraine, the main sources of germanium, of interest for its industrial extraction is waste from processing iron ore and products of steam coal combustion. The most common method to determine the small quantities of germanium remains spectrophotometric determination by phenylfluorone, because of its high sensitivity and ease of implementation.

Preparation and dissolution of samples of fly ash from coal-burning power used on the Dnieper HPP was carried out by GOST10175-75. The resulting solution was extracted with carbon tetrachloride.

Phenylfluorone (PF) was prepared by dissolving 50 mg of the reagent with gentle heating in 100 ml of 96 % alcohol, to which is added 0.5 ml of 6 N of hydrochloric acid. To improve optical characteristics and to stabilize the received germanium complexes with phenylfluorone was used a cationic surfactant (surfactant) – cetylpyridinium chloride (CPC), nonionic ethoxylated alcohols (I a–d) of industrial production, and their anionic derivatives (II a–b, III a–d):



Products II a, b:

- a) $n = 12-14$, $m = 5$ (Lutensol TO-5);
- b) $n = 10-12$, $m = 10$ (Sintanol ALM-10);

Products III a–d:

- a) $n = 12-14$, $m = 5$ (Lutensol TO-5);
- b) $n = 16-18$, $m = 20$ (Preparation OC-20);
- c) $n = 12-14$, $m = 10$ (Sintanol DS-10);
- d) $n = 10-12$, $m = 10$ (Sintanol ALM-10);

All surfactants used in the work, synthesized in UDHTU (Dnipro, Ukraine). Determined the extinction coefficients for λ_{max} in studied Ge-R-surfactant combinations. It is shown low dependence of K_n on the length of the alkyl radical, but decreasing the degree of ethoxylation substantially increases the molar extinction coefficient.