The Kapelka silver mineralization: prospecting, mineral composition and ore forming conditions

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The Kapelka silver-gold prospect is located in the Western Chukchi Peninsula, Russia. The mineralization is hosted by Upper Cretaceous volcanic and volcanic-sedimentary rocks of the Okhotsk-Chukchi Volcanic Belt and related to NE and NNE trending fault system.

The structure of the soil anomalies is distinguished as extended high-grade zone stretching over 7 km, having area of more than 10 sq km. Maximum silver concentration reaches 100 ppm. Abnormal concentration of Pb, Zn, Cu, As, Au are determinated in soils. Selective assaying fitted silver concentration in ores up to 1.5 % (Pb –12%, Cu – 2.2%, Zn – 0.8%, Au – 27 ppm, As - >1%). The LS mineralization is predominant at the Kapelka prospect. Orebodies occures as stockwork and veinlet systems and surrounded by quartzite, argillic and propylitic rock. The temperature of formation of propylitic and argillic rocks estimated from thermometer of Cathelineau [1] is 330-365 and 110-300°C, respectively. Gangue minerals are quartz, adularia, sericite, chlorite, epidote, carbonate, fluorite and montmorillonite. Ore minerals are pyrite-arsenopyrite, base metal (galena, sphalerite, chalcopyrite, bornite) and gold-silver-sulfosalts (electrum, polybasite, pearceite, acanthite and tetrahedrite-tennantite) assemblages. Native silver, acanthite, anilite, brochantite, anglesite, cerussite, malachite, azurite and wulfenite are supergeneous. The fineness of gold ranges from 614 to 493.

Primary inclusions in ore quartz are mainly mixed aqueous-gaseous. The size of inclusions ranges from 1 μm to 20 μm. Complete homogenization of fluid inclusions in quartz occurs at temperatures from 167 to 353° C, and the salt concentration is from 0.2 to 1.4 wt. % NaCl equiv. Fluid density varies from 0.58 to 0.91 g/cm^3. Pressure specified for the seething fluid at the temperature of 353° C was 16MPa, suggesting that mineralization was formed at the depth of 0.6 km.

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[1] Cathelineau (1988) *Clay Miner*. **23**, 471-485