

Scale change with production from deep-geothermal well in Kakkonda

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The scales precipitated in production well in production well of the Kakkonda geothermal area, North-eastern Japan, originated from the deep reservoir fluid that exists at the boundary between Quaternary Kakkonda granite and Pre-Tertiary formations. The scales of first production test are classified into two types based on sulfide mineralogy, Pb-Zn rich type and Cu rich type.

On progress of production the fluids from deep reservoir suffered by the fluid of shallow reservoir and meteoritic water. As changing chemical condition, mineral assemblage of scales of Well-13 changed from chalcocite (Cu_2S), loellingite (FeAs_2) and native antimony (Sb) to tetrahedrite ($\text{Cu}_{10}[\text{Fe},\text{Zn}]_2[\text{As},\text{Sb}]_4\text{S}_3$). But the ratio of the metal composition is almost constant. And the brine of WD-1a underlied Well-19 has the similar composition of the Well-19 scale. Therefore, deep reservoir of Kakkonda field evolves with mixing the fluid of shallow reservoir and the brine of occurred in the Quaternary Kakkonda granite.