

**Origin of solutions formed barite
and sulphide bearing barite deposits
and Pb-Zn mineralization in the
Taurus Belt, Southern Turkey:
Sulphur and lead isotope data**

OYA CENGİZ¹, ALI UCURUM²

¹Suleyman Demirel University Turkey, oyacengiz@sdu.edu.tr

²Cumhuriyet Univ. Turkey, aliucurum@cumhuriyet.edu.tr

Barite, sulphide bearing barite deposits and Pb-Zn mineralization are located in three different areas between Isparta-Konya (IK), Antalya and Mersin (AM), and Mus to Bitlis (MB) regions, which has NW-SE trending, Taurus Belt in southern Turkey. This study aims to reveal the origin of ore-forming solutions by sulphur and lead isotope data of barite, galena, pyrite, and sphalerite minerals.

In the IK area, S isotope ratios range from 24.8‰ to 30.7‰ for barite and 11.1‰ to 14.1‰ for galena, and have a value of 15.2‰ for pyrite-chalcopyrite. In the AM area, $\delta^{34}\text{S}$ ratios are at two different intervals between 15.0-20.3‰ and 27.4-31.8‰ for barite, have values between 4.6-14.4‰ for galena, and have a value of 4.2‰ for pyrite. In the MB area, S isotope ratios vary from 25.6‰ to 43.7‰ for barite and 12.1-16.8‰ for galena.

In the IK area, $^{206/204}\text{Pb}$, $^{207/204}\text{Pb}$ and $^{208/204}\text{Pb}$ isotope data for galena present values between 18.249-18.276, 15.712-15.718 and 38.463-38.486, successively. In the AM area, $^{206/204}\text{Pb}$ isotope results vary from 14.279-18.393 for pyrite and from 18.301-18.709 for galena, and $^{207/204}\text{Pb}$ isotope values are 15.672-15.710 for pyrite, 15.670-15.715 for galena, and $^{208/204}\text{Pb}$ isotope ratios are 38.432-38.611 for pyrite and 38.450-38.922 for galena. In the MB area, $^{206/204}\text{Pb}$, $^{207/204}\text{Pb}$ and $^{208/204}\text{Pb}$ isotope data for galena range from 18.221 to 18.250, 15.678-15.699, and 38.403-38.489, successively.

On evaluating results of sulphur isotope analyses, origin of solutions occurred barite and sulphide minerals has different sources. Sulphur sources result from dominant seawater and partly shale and Ba and Sr from seawater and metamorphic rocks. Pb results from continental crust materials. Origin of the solution may be interpreted as hydrothermal fluids mixing with seawater interacting with Cambrian-Permian carbonates and clastic metamorphic rocks. However, the mineralization shows a partial similarity to Mississippi Valley type deposit in respect of deposition forms but no relation with directly magmatic rocks, deposition in commonly carbonated rocks, and S isotope ratios.