

# TL AND EPR DATING OF POLUTEPE ARCHEOLOGICAL SITE IN AZERBAIJAN

Sahib Mammadov<sup>1</sup>, Aybeniz Ahadova<sup>1</sup>

<sup>1</sup> Institute of Radiation Problems, 9. B.Vahabzade str., 1143, Baku, Azerbaijan Corresponding author: [s.mammadov@irp.science.az]

Polutepe is the largest Neolithic-Eneolithic monument in the Caucasus. It is located on the eastern outskirts of Uchtepe village of Jalilabad region, Azerbaijan Republic, on the right (southern) bank of the Injachai river (39°19' 37. 67" N, 48° 27' 05.71" E) at 38 m above sea level. This work used EPR and TL methods to determine the age of archaeological artifacts found at the archaeological site of Polutepe (Azerbaijan). The results of radiocarbon dating for the same site have been published elsewhere [1][2]. A charcoal sample excavated at the Polutepe site was dated by the conventional radiocarbon method at 4,270±160 BC.

The quartz inclusion method is employed for the TL dating. The quartz samples used in this experiment were extracted from ceramics using conventional chemical separation. Plotting the TL glow-curve intensity at 375°C against the dose adsorbed and backward extrapolation enables the estimated historical dose to equal 22.19±1.36 Gy. U, Th, and K concentrations were 2.24±0.20 ppm, 8.31±0.80 ppm, and 2.39±0.23%, respectively. Dose rate and age calculation were conducted using the DRAC version 1.2, and output results are as follows: Environmental dose rate: 3.46±0.19 Gy/ka and; sample age: 6,400±530 BC years.

The investigated object for the EPR investigations was the presumable lower jaw of a caw with a well-preserved tooth. The calculation of the annual dose rate was based on the estimated cosmic dose rate and U, Th, and K content obtained from soil sample analysis. The cosmic dose rate was determined to be 119 microGy/a. The average moisture content of the sediment was taken as 15% based on measurements at the site. Uranium concentration determined directly in the tooth enamel was less than the detection limit; therefore, the possible uranium uptake was not considered. The total estimated annual dose rate was equal to 1,543 microGy/a. The mean age of the sample was determined as 7,770 ± 130 years

Keywords: ESR dating, TL dating, tooth enamel, pottery

References

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## Section

Energy and materials science (Section 2)

**Primary author:** MAMMADOV, Sahib (Institute of Radiation Problems, Ministry of Science and Education)

**Co-author:** Ms AHADOVA, Aybeniz (Institute of Radiation Problems, Ministry of Science and Education)

**Presenter:** Ms AHADOVA, Aybeniz (Institute of Radiation Problems, Ministry of Science and Education)

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