J Geol Geophys 2017, 6:3(Suppl)
http://dx.doi.org/10.4172/2381-8719-C1-009

Determination of mercury in gold ores by CVAAS method

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Gold is recovered from gold ores. Within the ores, there are not only gold but also several types of precious metals. Copper, silver, and platinum group elements (ruthenium, rhodium, palladium, rhenium, osmium, and iridium) are metals commonly found in the ores. These metals combine to form an ore because they have the same properties. It is due to their position in periodic-system-of-elements which are near to gold. However, there is no previous study that mention the presence of mercury in every gold ores, even though it is located right next to gold in the periodic-system-of-elements and they are located in the same block, d-block. But, it is possible that mercury is contained in the ores. Moreover, the elements of the same group with mercury-zinc and cadmium-sometimes can be found in the ores. It is suspected that mercury cannot be detected because the processing of gold ores is usually done using fire assay method. Before the ores melt, mercury would evaporate because it has the lowest boiling point when compared to all precious metals in the ores. Therefore, it suggested to do research on the presence of mercury in gold ores using CVAAS method. The results of this study would obtain the amount of mercury in gold ores that should be purified. So it can be produced economically if possible.

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States of local stresses and relative locations of small earthquakes in the Sea of Marmara

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Extensional focal mechanism solutions are mostly observed in the Central Marmara. By this comprehensive research although the main Marmara Fault, the western branch of the North Anatolian Fault Zone (NAFZ), is dominated by a right lateral strike-slip regime. Marmara Region is a seismically very active area. The 1912 Mürefte and 1999 Izmit earthquakes are the last devastating earthquakes of the western and eastern sections of it, respectively. The region between these earthquakes, close to Istanbul, is prone to a large earthquake. Therefore, the analysis of the Marmara Sea is significant. The goal of this research is to determine earthquake hypocenters and focal mechanism solutions accurately, hence obtain recent states of stresses in the Marmara Region. Accordingly, this research aims to define branches of fault structures and their geometrical orientations. In this study, six clusters of earthquakes are located using hypocenter program. Next, they are submitted to the stress tensor inversion procedure and their simultaneous focal mechanism solutions are obtained. Besides, they are relocated once again using HYPODD relative location technique. Consequently, from the comparison of relocation results of hypocenter and HYPODD programs, it is found out that most of the relocations have the same orientations due to the usage of a high quality data set. Dipping angles of the segments of the Main Marmara Fault could not be observed; on the other hand, important information is discovered about seismogenic zones. Besides, mostly NE-SW oriented extensional stress structures are found in the five regions, while a right lateral strike-slip stress structure is found in the most western Marmara. Further, our sensitive relocation and stress analyses will make an important contribution to a better understanding of the fault movements of the Sea of Marmara, and shed light on earthquake rupture analyses for heterogeneous stress states and other seismological studies.

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