Geochemical zonation in Mirkoh alimirza area, Arasbaran zone, NW Iran

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The Mirkoh Ali Mirza area is located in the Arasbaran zone. Arasbaran Zone in NW of iran is a metallogenic province of Cenozoic age. Mineralization in this zone is associated mainly plutonic-volcanic-related porphyry copper, skarn copper-gold and epithermal gold deposits.

The major exposed rocks in the area are related to Neogene volcanic and subvolcanic rocks. The local mineralization is structurally controlled, and are localized preferentially in faults and fault intersections. The alteration is dominated by quartz, propylitic, argillic, sericite.

Recent geochemical studies within the north of Mirkoh Ali Mirza area shows a distinct lateral metal zonation of gold and base metals which can be used as a guide to exploration of copper porphyry at depth in the adjacent magmatic systems. Chemical variation include Cu as disseminated sulphides and stockwork systems in the center of suvolcanic-volcanic dom. The Au-Ag mineralization shows lateral zonation to outside of the Cu mineralization. The outside chemical zonation continues to Sb, Pb, Zn, Ba and Mn.

Data processing of geochemical data shows low but anomalous values for Mo, W, Be and Bi which are associated with the Cu-Au-Ag-Sb mineralization. These elements are sensitive indicators of physicochemical conditions during the ore deposition and therefore can be used as a tool for outlining the center of hydrothermal activity in the sub volcanic body and hydrothermal fluid evolution respect to time and space.

Evaluation study of CCS for the mitigation measure of atmospheric CO_2 and ocean acidification by the global carbon cycle model

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Background

IPCC AR4 reported that the emission of the anthropogenic Carbon Dioxide (CO_2) increase the CO_2 concentration in atmosphere after the Industrial Revolution, and increasing of CO_2 concentration caused the global warming. Moreover, it is shown that CO_2 dissolution into the ocean causes the acidification in the surface layer. The buffering effect of the ocean can suppress the change of the CO_2 concentration in the atmosphere. However, the rise of the CO_2 concentration in the ocean surface means the pH of seawater decreases. This phenomenon continues until the difference of CO_2 partial pressure between the atmosphere and the ocean disappears if the emission of CO_2 is stopped. But, the acidification of the ocean progresses as long as it keeps CO_2 emission. It is feared that the ocean acidification has crises influence on various organisms and entire ocean ecosystem.

Methods and Results

Carbon Capture and Storage (CCS) is one of the mitigation measure technologies of CO_2 emission. Famous carbon storage technology of the CCS using ocean region is sub-seabed geological storage (SGS) and dilution type ocean sequestration (DOS). The evaluation and comparison study for atmospheric CO_2 decreasing measure and ocean acidification mitigation measure was carried out using 3-dimensional numerical model with ocean circulation model and a global carbon cycle model based on a lower trophic ecosystem model. The results of the simulation study under the several scenarios showed "SGS without leakage is the best as the effect of measures". And it is suggested that "There is a possibility of suppressing the ocean surface acidification to more effective by combining DOS with SGS". This study is supported by the CCS project of RITE under the fund from METI.