The study on volatile petroleum hydrocarbons (VPH) in soils from refueling service station in Beijing, China

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The VPH generated by the light-density fuels during the process of storage and transportation in refueling service station can bring about a series of negative influences to health, environment, safety. The surface soils about 5-30cm from three refueling service stations of North Fifth Ring Road and two of the side road to airport, which were put into wide mouth bottle with a brown and sealed in cryopreservation. Another surface soil sample came far away from refueling service stations by comparison. The composition of VPH in 5g accurate soil samples were identified and quantified by purge- and -trap gas chromatography-mass spectrometry, using the improved Method Massachusetts VPH. A standard VPH mixture included aliphatic of C5-C7 (pentane, hexane) and (octane, decane, dodecane), aromatic of C9-C12 (1,2,3-trimethylbenzene, naphthalene), MTBE, benzene, toluene, ethylbenzene, m/p-xylene and o-xylene. The result shows that VPH values of samples at refueling service stations are higher than the comparative sample. However, all samples did not detect MTEB. Aliphatic of C5-C7 and toluene could be detected in all samples at refueling service stations, and the value of aliphatic of C5-C7 is highest among the VPH, followed by toluene. One of refueling service station at the side road to airport, the experimental data shows that VPH values of the sample are obviously higher than others, and the total value of VPH is up to 570.25ng/g. The main component of VPH is the same in all samples at refueling service stations, which means pollutions of VPH in soil of refueling service station mainly comes from violate and deposition of VPH. Therefore, refueling service station should improve the corresponding technology to control volatile of petroleum□and repair the polluted soil.

Geochemical data analysis of Deh-Salm area using neuro-fuzzy networks

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All previously discovered ore bodies in the Lut (east of Iran) ore field are Cu-Mo porphyry mineralization type and located in the places where dilational fault zones cut the contact zone of the Deh-Salm granitoid complex [2]. Conventional geochemical exploration models, which are used for determining anomalies in both local and regional scales, are generally based on multi-variable statistical analysis, metallometry survey, vertical geochemical zonality and other geochemical methods. In general, these methods have several limitations: 1) the separation of anomalies, which their data do not have normal distribution, is problematic, 2) the separation of anomaly from background, where the anomaly is associated with the formation mechanism, is difficult, 3) the results of various anomalies do not correlate on contour maps, and 4) the preparation of pattern recognition for various anomalies is not suitable. These limitations cause the process of interpretation to be time-consuming and costly. It seems that the method of neuro-fuzzy networks for specific mining geochemistry is very proper [1]. Fuzzy theory considers uncertainties in recognition of multiple anomalies and artificial neural networks possess high capabilities in learning existing models. The combination of these two tools creates a suitable technique for recognizing multiple anomalies, and is capable of using standard exploration existing models and considering their uncertainties, and thus, reduces exploration costs and produces reliable results. This technique has been used in this thesis to discriminate dispersed mineralization zones from blind mineralization zones. The results obtained by applying this technique are in good agreement with the results obtained using conventional methods, and in addition, the technique does not contain the above limitations mentioned for conventional methods.

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