Summer 5-25-2014

Identification of elements by neutron activation analysis

Krishna Mohana A

Abstract

Neutron Activation Analysis (NAA) is an analytical technique to qualitatively as well as quantitatively identify the elements present in the unknown sample. NAA is a non destructive technique which is widely employed in the areas like trace element analysis, forensic, archaeological, geological, environmental, biological and many more. NAA can give simultaneous determination of about 25-30 major, minor and trace elements of samples in ppb-ppm range. The main objective this work is to identify element in the unknown sample.

In order to identify the elements present in the unknown sample, the sample was irradiated with neutrons from AmBe neutron source. The sample became radioactive and it was taken for counting in the NaI and HPGe detectors. The spectrum was obtained and the photo peaks analysis was done. For each photo peak, Region of interest was selected and centroid channel was obtained and the corresponding photo peak energy was noted. For these photo peak energies the possible isotope which give rise to these lines was identified from Evaluated Nuclear Sructured Data File (ENSDF). The isotopes were identified to be ^{198}Hg, ^{115}In, ^{116}In. These isotopes have very short half lives and could have been fed by it's parents. The possible parents were ^{198}Au, ^{115}Cd and ^{117}Cd.