

Age Determination of Fossil Shell Samples from Southern Shores of Iran Using Radiocarbon Dating

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Abstract

In this study, the method of radiocarbon dating has been applied to determine the age of the fossil shell samples, of the southern shores of Iran. The Radiocarbon (^{14}C) Dating method is applied in many fields including oceanography, geology and archaeology.

In this method the under test sample is pretreated by physical pretreatment and chemical procedures and then using a Benzene Synthesis System, benzene (C_6H_6) is synthesized from the sample. One grams of the synthesized benzene added into a Teflon counting vial which contains the 12 ml scintillator Hisafe3. In order to count and determine the radioactivity concentration of beta particles emitted from radiocarbon, the liquid scintillation counting system is applied.

Age determination of fossil samples carried out using the count per minute (cpm) values from beta counting of ^{14}C in synthesized samples comparing to obtained results from the oxalic acid modern standard.

For 8 explored shell samples, the range of determined ages is 210-3890 years, according to Before Present (BP; before 1950). Counting efficiency of Liquid Scintillation Counting system for ^{14}C is calculated to be about 92% and the calculation error for low age samples was ± 40 years and for high age samples was ± 100 years, respectively.

Keywords: Radiocarbon dating, Liquid Scintillation Counting, Archaeology

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