

INSTRUMENTAL NEUTRON ACTIVATION ANALYSIS OF MARINE SEDIMENT IN-HOUSE REFERENCE MATERIAL

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ABSTRACT

Reference materials play an important role in demonstrating the quality and reliability of analytical data. The advantage of using in-house reference materials is that they provide a relatively cheap option as compared to using commercially available certified reference material (CRM) and can closely resemble the laboratory's routine test sample. A marine sediment sample was designed as an in-house reference material, in the framework of quality assurance and control (QA/QC) program of the Neutron Activation Analysis (NAA) Laboratory at Nuclear Malaysia. The NAA technique was solely used for the homogeneity test of the marine sediment sample. The CRM of IAEA- Soil 7 and IAEA- SL1 (Lake Sediment) were applied in the analysis as compatible matrix-based reference materials for QA purposes.

ABSTRAK

Bahan rujukan memainkan peranan penting dalam memberi petunjuk kualiti dan keyakinan terhadap data analisis. Kelebihan menggunakan bahan rujukan 'in-house' adalah ia menyediakan pilihan yang lebih murah berbanding bahan rujukan piawai dan ia boleh lebih menyerupai sampel ujian rutin makmal. Satu sampel sedimen marin telah dipilih sebagai bahan rujukan 'in-house' dalam struktur program kualiti jaminan dan kawalan (QA/QC) Makmal Analisis Pengaktifan Neutron (APN) di Nuklear Malaysia. Hanya teknik APN yang digunakan untuk ujian kehomogenan sampel sedimen marin. Bahan Rujukan Piawai IAEA- Soil 7 dan IAEA- SL1 (SedimenTasik) telah digunakan dalam analisis ini sebagai bahan rujukan yang mempunyai matrik bersesuaian untuk tujuan kualiti jaminan.

Keywords: in-house reference material, neutron activation analysis, marine sediment

INTRODUCTION

Every day, chemical and biological measurements are performed by a large number of analysts in laboratories throughout the world and they have to show that the method used is error free and the results obtained are reliable for each parameter analyzed. They need to undertake method validation procedure, a process that has to be re-checked periodically when changing working procedure. During method validation, there are different quality parameters, which characterize the method and must be established such as accuracy; precision; quantification and detection limits; linearity range; sensitivity; and, robustness. Furthermore, laboratories have to design strategies for assuring not only internal quality control (QC), but also some kind of external QC,