Correction of dead time affects for cyclic neutron activation analysis

Van-Doanh Ho[1*], Manh-Dung Ho[2], Van-Giap Pham[3], Tuan-Anh Tran[1]

[1]Nuclear Research Institute, 01 Nguyen Tu Luc street, Dalat city, Vietnam
[2]Center for Nuclear Technologies, 217 Nguyen Trai street, Ho Chi Minh city, Vietnam
[3] Xuan Loc high school, Dong Nai province, Vietnam
*E-mail address of the corresponding author: hovandoanh@gmail.com

Keywords: Dead time, Pile-up, Cyclic neutron activation analysis, k_0-CNAA.

In this study, the correction of dead-time and pile-up affects have been performed for the k0-based cyclic neutron activation analysis method (k0-CNAA) at Dalat research reactor. The correction factors were applied for determination of short-lived radionuclides such as 46mSc (18.75 sec.), 179mHf (18.75 sec.), 165mDy (75 sec.), 52V (3.74 min.), 51Ti (5.76 min.). After correction of dead-time and pile-up losses, the analytical results were significantly improved in terms of accuracy by comparison with certificate values of NIST-2711A reference material. Moreover, these results can be applied for correction of dead-time up to 62% in k0-CNAA method.