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**Analysis of Gamma Resonance Absorption in ^{14}N
by Using the Radiative Direct Capture Reaction Theory**

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Abstract

The 9.17 MeV gamma resonance absorption by ^{14}N can be used to detect nitrogenous explosives because of the narrowness of the resonance, its large integrated cross section, and its uniqueness to nitrogen. The inverse reaction $^{13}\text{C}(p, \gamma)^{14}\text{N}$ at $E_p=1.75$ MeV is advantageous to obtain the corresponding gamma ray. In this work, the radiative capture reaction $^{13}\text{C}(p, \gamma)^{14}\text{N}$ and the inverse reaction $^{14}\text{N}(\gamma, p)^{13}\text{C}$ have been theoretically analyzed on the basis of the direct reaction theory for the radiative capture reaction.