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Title: Gamma-ray spectroscopic and PIXE analysis of selected samples from the phosphorite deposits of Northwestern Saudi Arabia

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Abstract: Phosphorite deposits from northwestern Saudi Arabia were analyzed by natural radioactivity measurements to detect the presence of radioactive elements. PIXE was used to obtain an average elemental composition of these deposits. From the analysis of radiations from U-238, Th-232 and K-40 isotopes, the samples were found to contain U, Th and K in concentrations up to 130 ppm, 30 ppm and 2.5 wt%, respectively. PIXE showed the presence of a number of trace elements such as Ca, V, Cr, Fe, Ni, Cu, Zn, As, Sr, Y and U in concentrations ranging from a few ppm. to several hundred ppm. The occurrence of these radioactive and non-radioactive elements are discussed for their geological significance in the phosphorite deposits.