

**DETERMINATION OF NATURAL (^{226}Ra , ^{232}Th AND ^{40}K) AND
ARTIFICIAL (^{137}Cs) RADIOACTIVITY CONCENTRATIONS IN SOIL
SAMPLES COLLECTED FROM GÜMÜŞHANE**

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The aim of the present study is to determine natural (^{226}Ra , ^{232}Th and ^{40}K) and artificial (^{137}Cs) radionuclides in soil samples collected from the vicinity of the Gümüşhane province. In all a total of 34 soil samples were analyzed. The concentrations of natural radionuclides in soil samples around Gümüşhane were determined by a high-purity germanium detector (HPGE detector). It was found that activity concentrations ranged from 5.8 to 120,34 Bq kg⁻¹ for ^{226}Ra , from 9.38 to 159.5 Bq kg⁻¹ for ^{232}Th and from 251.39 to 1222.84 Bq kg⁻¹ for ^{40}K . Besides naturally occurring radionuclides, ^{137}Cs activity concentration was measured in soil samples and it was found that ^{137}Cs activity concentration ranged from 0,31 to 16,51 Bq kg⁻¹. Obtained values show that the mean radium equivalent activity (Raeq) were from 46 to 434 Bqkg⁻¹. The results obtained revealed that the Budak village has higher activity concentration values as compared to other sampling points.

**NEW GENERATION ACCELERATOR DRIVEN SUBCRITICAL
REACTOR SYSTEM (ADS) COMPARISON WITH TRADITIONAL
CRITICAL REACTORS**

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In recent years, the accelerator driven subcritical reactors have seen great interest worldwide. These reactors which are hybrid systems are important in production of clean and safe energy and conversion of radioactive waste. Accelerator driven reactors (ADS) with the selection of reliability and robust target materials have been the new generation of fission reactors. In addition, in ADS Reactors the problems of long-lived radioactive fission products and waste actinides problem seen in fission the reactor of by incineration method can be solved, and ADS has come to the forefront of thorium as fuel for reactors.

In this study, nuclear power change, neutron efficiency and advantages in terms of safety of the ADS reactor have been calculated and it compare with the conventional reactor.