GAMMA ATTENUATION BEHAVIOUR OF BORON CARBIDE-SILICON CARBIDE COMPOSITES

Buyuk B.[(1)], **Tugrul A.B.**[(1)], **Addemir A.O.**[(2)], **Akarsu A.C.**[(2)]
[(1)]Istanbul Technical University, Institute of Energy, Ayazaga Campus, Sariyer, 34469, Istanbul, Turkey, buyukbu@itu.edu.tr, beril@itu.edu.tr
[(2)]Istanbul Technical University, Metallurgical and Materials Engineering Faculty, Ayazaga Campus, Sariyer, 34469, Istanbul, Turkey, addemir@itu.edu.tr, akarsuc@gmail.com

In this study the gamma radiation behavior of boron carbide-silicon carbide composites were investigated. The materials which were used in the experiments were produced at 2250 °C under 130 MPa pressure for 2 hours. The materials were produced at different boron carbide percentages. The samples have 60%-100% boron cabide ratios.

In the experiments Cs-137 and Co-60 gamma radioisotope sources were used for radiation attenuation curves. Cs-137 gamma radioisotope source has single gamma peak at 0.662 MeV energy and Co-60 gamma radioisotope source has two energy peaks at 1.17 MeV and 1.33 MeV. The gamma radiation attenuation curves were drawn for Cs-137 and Co-60 radioisotopes of boron carbide-silicon carbide composites at different boron carbide ratios. Linear and mass attenuation coefficient values were calculated for each material for each radioisotope. The theoretical values were also calculated from XCOM computer code.

In the results of experiments and XCOM computer code, it could be seen that they were closed to each other. Also it is shown that increasing silicon carbide ratio in the boron carbide-silicon carbide composites causes higher linear attenuation values. It could be said that increasing the silicon carbide ratio causes higher gamma shielding property for boron carbide- silicon carbide composites.