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ABSTRACT

Boron carbide (B_4C) is an important type of neutron radiation shielding material with relatively high efficiency due to the high content of ^{10}B element. Incorporation of B_4C particles into polymer to prepare high-performance neutron radiation shielding material has become more and more important for the safe operation of nuclear power in the defense industry and nuclear power plant. The polyimide/B_4C composite films with different micro-sized B_4C contents were successfully prepared by *in-situ* polymerization. Silane coupling agent KH550 was employed to functionalize B_4C particles to improve the dispersion of B_4C particles in the polyimide matrix with strengthened interfacial interaction. As shown that the micro-sized B_4C functional particles can be well dispersed in the BPDA/ODA polyimide matrix. With the B_4C content increase, thermal stability of the polyimide/B_4C composite films can be significantly improved, even mechanical properties partly declined. Meanwhile, the