

CERTIFICATE NO : **ICRESMH /2025/C0425428****An Effectiveness of The Synthesized Boron Agents in Targeting and Delivering Drugs to Tumor Cells****Shinde Sachin Babasaheb**

Research Scholar, Department of Chemistry, Mansarovar Global University, Sehore M.P., India.

**ABSTRACT**

The effectiveness of synthesized boron agents in targeting and delivering drugs to tumor cells has become an important area of research in modern cancer therapy. These boron-based compounds are specifically designed to carry a high concentration of boron atoms and selectively accumulate in cancerous tissues. Their effectiveness largely depends on their ability to recognize and bind to tumor cells while minimizing interaction with healthy tissues. In many studies, synthesized boron agents are modified with biological molecules such as peptides, antibodies, or other targeting ligands that help them identify tumor-specific receptors. This targeted approach allows the boron compounds to concentrate within malignant cells, improving the precision and efficiency of treatment. In therapies such as Boron Neutron Capture Therapy (BNCT), the successful delivery of boron to tumor cells is essential for achieving therapeutic effects. When sufficient amounts of boron accumulate in the tumor and the area is exposed to neutron radiation, a nuclear reaction occurs that releases high-energy particles capable of destroying cancer cells locally. The synthesized boron agents therefore act as both targeting molecules and therapeutic carriers. Their effectiveness is often evaluated through factors such as tumor selectivity, cellular uptake, biocompatibility, and minimal toxicity to normal cells. Advances in nanotechnology and medicinal chemistry have further improved the design of these boron agents, enhancing their stability, solubility, and drug-delivery capabilities. As a result, synthesized boron agents hold great promise for improving targeted cancer treatment and increasing the overall success of tumor-specific therapies.