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## A preliminary study on a new epoxy resin system IR-3 for the high-field HTS applications

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In high field applications, the HTS coils are commonly impregnated with epoxy resins for insulation and mechanical reinforcement to against the huge Lorentz forces. Till now, many of the epoxy impregnated ReBCO based HTS coils show some degree of performance degradation ( $J_c$ ) due to thermal stress during cool down, electromagnetic stress during operation or any other reasons. It remains a challenging task to find an appropriate impregnation method for this type of HTS coils. In this study, for the first time, the effects of a new epoxy resin system IR-3 which was developed by the Institute of Physics and Chemistry, Chinese Academy of Sciences (IPC-CAS) were investigated in the Institute of High Energy Physics (IHEP-CAS) for the high-field application. At liquid nitrogen temperature, the cool down, local heat pulse and over-current results showed that the coils impregnated with the IR-3 exhibited almost the same superior thermal and electrical stabilities as compared to those potted with CTD-101K and Araldite MY750 that widely used in superconducting magnets. After 20 times of thermal cycles, all the IR3 impregnated HTS coils showed no decay in critical current. Study at 4 K under the high background magnetic field and the corresponding experimental results will also be presented and discussed. Considering the acceptable radiation resistances, higher strength than CTD-101K at low temperature and longer pot life than MY750, IR-3 resin system is a suitable candidate for impregnating high-field HTS coils.

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