**Partial discharge pattern recognition of polymeric insulating material using artificial neural network**

Abstract

In order to improve long-term reliability of XLPE power cables, it is essential to understand the mechanisms of degradation and breakdown of solid insulation materials such as XLPE and its interfacial phenomena. The insulation performance of polymers usually decreases quickly with high voltage application, if partial discharges (PD) occur in voids or defects. Hence, PD detection and diagnosis are one of the most important means to test HV cables. In the recent years, PD tests have been widely conducted after XLPE cables were completed, and the importance of PD test has been already recognized [1]. Moreover, we have investigated physical phenomena and degradation processes by measuring PD of XLPE cable joint [2-6]. However, identification of defects and degradation processes of XLPE power cable joints particularly in the interface, have not been fully understood yet [7-9]. From this viewpoint, we have been trying to identify the types of defects and elucidate the degradation processes of XLPE cable joint by measuring phase-resolved PD (f-q-n) patterns and PD statistic parameters, etc (PD characteristics). The artificial neural network method (back propagation network) was employed to identify the PD pattern due to different kind of defects.