Development of a XLPE insulating with low peroxide by-products

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The chemically crosslinked polyethylene (XLPE) is widely used in MV/HV insulating due to its good electrical properties and good thermomechanical behavior. However as a result of the chemical crosslinking, the generation of gas and polar by-products from the peroxide are generated.

For safety reason related to its flammability, such gas has to be removed prior any cable termination preparation and jointing process. Furthermore, under working conditions some gas could be released along the cable and affect the reliability of the accessories. The presence of such gas modify the interface pressure between the cable and the splice body which leads to partial discharge generation and then to the dielectric breakdown.

The degassing of insulating is a key parameter for the quality of cable. This step needs several days of heating according to the thickness of the insulating before jacketing.

Furthermore, the polar by-products (acetophenone, cumyl alcohol…) influence electrical properties such as dissipation factor and space charge accumulations.

The purpose of this article is to present a new XLPE with very low content of by-products (gas and polar) and which fulfill the standard requirement of crosslinking density (Hot Set Test < 175%).

We discuss the influence of the chemical nature of peroxide and crosslinking promoter and we display some mechanical and electrical properties.