



B.5.4. Utilisation des matériaux plastiques réticulés à l'aide des radiations nucléaires dans la construction des câbles

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B.5.4. The utilization of cross-linked plastic materials by means of the nuclear radiations in the construction of the cables

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RÉSUMÉ

On a étudié comparativement des échantillons de XLPE réticulés chimiquement et radiochimiquement. L'irradiation a été réalisée dans l'air, à la température de la chambre. Les doses totales ont été comprises entre (50-300)KGy. On a étudié l'influence du degré de réticulation sur les propriétés électriques et mécaniques des échantillons. À l'aide de l'analyse spectrophotométrique IR on a mis en évidence des modifications structurelles des matériaux. On décrit un modèle qui puisse expliquer la formation des microcavités dans le XLPE sous l'influence des radiations.

ABSTRACT

Samples of XLPE chemically crosslinked and radiochemically crosslinked was comparatively studied. The irradiations have been effectuated in air, at the room temperature. The total doses have varied between (50-300)KGy. The influence of the crosslinking degree on the mechanical and electrical behaviour was studied. Structural changes were observed by means of IR spectrophotometric analyses. A model of forming of the microcavities in XLPE through irradiation was described.

1. Introduction

In the modern technology of the cables there are utilized: Low Density PE-LDPE, Medium Density PE-MDPE, High Density PE-HDPE, crosslinked PE-XLPE, Very Low Density PE-VLDPE[1]. VLDPE is an amorphous polymer with a degree of crystallization of 0% and a very different density from $0,915 \text{ g/cm}^3$, which is the density of conventional PE. At present, the most insulations of the cables of medium and

high tension utilize crosslinked PE. By crosslinked of the PE macromolecules, its temperature of function rises from approximately 70°C to 90°C . At the same time, in this case, less chain-ends appear, the mechanical resistance rises and as a result, one gets an improved resistance at the appearance of the trees. Among the chemical methods of crosslinking of PE, we mention: the utilization of peroxides, by steam but by using hot