



EFFECTS OF AGING ON GLASS FIBER – EPOXY REPAIR MATERIAL FOR OIL PIPELINES

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Abstract: Pipelines are commonly used in the oil industry for the transportation of fluids. These structures are susceptible to various types of damage during operation. Substitution of existing pipelines is often unviable and alternative approaches to repair the damaged pipeline are often employed. One of the alternatives for repairing oil pipelines involves the use of glass fiber reinforced composites due to their high chemical resistance and mechanical performance. However, under operational conditions the repair material can be exposed to various environmental factors throughout its service life, which can reduce the durability and safety of such repairs. In this work, glass fiber-epoxy composites employed as repair material for oil pipelines were subjected to accelerated aging in an accelerated aging chamber with alternated cycles with water condensation and UV-radiation. Aged and unaged materials were evaluated by Fourier Transform Infrared (FTIR) Spectroscopy, Dynamic-Mechanical Analysis (DMA), and Scanning Electron Microscopy (SEM). Results showed alterations caused by accelerated aging, which include an increase in crack density, chemical alterations and changes in glass transition temperature.

Keywords: pipeline, glass fiber reinforced composites, aging