

Study of the evolution of the mechanical properties of the steel pipe coatings in controlled environments

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Abstract : In this study, the experimental results are present the evolution of mechanical properties according to some aggressive environments with a coating of high-density polyethylene, steel pipe used for transporting hydrocarbons. The standard specimens tested in dumbbell shaped were prepared according to ISO 527. The mechanical properties are measured in traction using a computer-driven testing machine. The environments have shown that they have a real influence on the behavior of specimens subjected to uniform traction. The results are discussed in terms of curves (σ , ϵ). The tensile strength is generally between the values 19.5 and 25.5 MPa, this property comes after the total stretch of the specimen where it has been under severe strain that strongly influence the original structure of the material. In the synthetic oil, the elastic modulus is reduced by 42% and the yield strength collapsed completely in the case of 50% of the crude oil.

Keywords : Pipe, aggressive environnement, polyethylene, mechanical properties, degradation.