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Study of the performance of silanes in the steel pre-treatment for repair of industrial piping

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Adhesives used in the steel joints bonding is expected to withstand the widely varying environmental conditions which cause changes in its structure and eventually lead to its failure in service. A coupling agent not only improves the total adhesive strength, but also the durability of the adhesive joint [1, 2]. This work investigates of the concentration influence of silane, their storage time and method of packaging in the performance as coupling agent in an adhesive joints bonding process. It is concerned with the rate of hydrolysis of the silane in aqueous and ethanolic solutions, which is thought to be a key process in the application of the silane coupling agent during fabrication. Previous workers [3, 4] have stressed the importance of pH on the rate of reaction. The dependence of the rates on pH is investigated. It is concluded that the rates are very pH dependent, and adequate control of pH is essential for a reproducible manufacturing process. Results are presented for aqueous and ethanolic solutions.

[1] P.E. Cassidy, J.M. Johnson and G.C. Rolls, Ind. Eng. Chem., Prod. Res. Dev.,11(2), 170 (1972).
[2] A. M. Limaverde, E. M. Sampaio, A. H. M. F. T. da Silva, F. L. Barcia, 18º CBECIMAT - Congresso Brasileiro de Engenharia e Ciência dos Materiais, (Porto de Galinhas, PE, Brasil, 2008).
[3] K. J. McNeil, J. A. DiCarti, D. A. Walsh, R. F. Pratt, J Am Chem Soc, 102:1859 (1980).
[4] F. D. Osterholz, E. R. Pohl, J Adhesion Sci Technol, 6:127 (1992).