

CO-PROCESSING CONCEPTION OF A QUENCHING PLASMA REACTOR ASSOCIATED TO A FLUIDIZED BED DESIGNED TO HYDROGEN RADICAL PRODUCTION AT LOW TEMPERATURE

M.N. Mohammadi, S. Cavvadias, J.L. Leuenberger, E. Francke, J. Amouroux
Université Paris VI (Pierre et Marie Curie), École Nationale Supérieure de Chimie de Paris
Laboratoire de Génie des Procédés Plasmas. 11, rue Pierre et Marie Curie 75005 Paris, France

ABSTRACT

The basic idea of a plasma reactor working at atmospheric pressure and dedicated to radical flow production such as H^\bullet , demands to reach temperatures in the order of 3000 K and 4000 K which is the range corresponding to the hydrogen molecule dissociation. In such conditions, applications of these radicals are limited by thermal aspects which are different from traditional reactions of hydrolysis or other treatment processing of organic molecules.

Our approach in this paper is to elaborate a reactor the transport properties of which are compatible with atomic hydrogen flow production at low temperature. In this point of view, the plasma torch/fluidized bed system is qualified in terms of its thermodynamical and hydrodynamical properties and its quenching velocity.

The atomic hydrogen flow generated in such conditions is calculated and then experimentally measured.