



“Gheorghe Asachi” Technical University of Iasi, Romania



CONVERTING END-OF-LIFE PLASTIC WASTE INTO METHANOL: THE GASIFORMING™ PROCESS AS NEW, EFFICIENT AND CIRCULAR PATHWAY

Kristiano Prifti¹, Andrea Galeazzi¹, Irene Margarita², Andrea Papale², Sergio Miele³,
Enrica Bargiacchi³, Massimo Barbieri⁴, Michelangelo Petea², Flavio Manenti^{1*}

¹Politecnico di Milano, CMIC Dept. “Giulio Natta”, Piazza Leonardo da Vinci 32, 20133 Milano, Italy

²ACEA SpA, P.le Ostiense 2, 00154 Roma, Italy

³INSTM, Interuniversity National Consortium for Material Sciences and Technologies, Via G. Giusti 9, 50121 Firenze, Italy

⁴Politecnico di Milano, Technology Transfer Office, Piazza Leonardo da Vinci 32, 20133 Milano, Italy

Abstract

The mixed plastic waste problem is becoming an important issue in scientific and technological communities in light of the environmental pollution caused by its poorly management. In this paper a new and efficient thermo-catalytic pathway to convert plastic waste into methanol is presented in its key features and global yields. The process has been mainly developed in silico using Aspen HYSYS V10 with support from experimental data where simulation could not provide reliable information such as the gasification step. Consolidated kinetic models are used both for the reforming and methanol synthesis steps, while the pre-reforming reactor is simulated at the thermodynamic equilibrium. The temperature, pressure, and mass flow balances of the system are reported alongside some of the most important key performance indicators for reforming (methane slip) and methanol synthesis (SN ratio).

Key words: circular economy, methanol, plasmix, plastic wastes, process simulation

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* Author to whom all correspondence should be addressed: e-mail: flavio.manenti@polimi.it