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Synthesis of carbon nanotubes from polyolefin waste: mass balance and gas phase composition

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The valorization of plastic solid waste (PSW) through thermochemical routes has emerged as a sustainable strategy to address the growing accumulation of these materials. Among the most attractive products, carbon nanotubes (CNTs) stand out due to their high added-value and potential applications in catalysis, sensors, and environmental remediation. CNT synthesis from plastics typically involves thermal decomposition of the polymer into a carbon-rich gas fraction, followed by its deposition on metallic nanoparticles to form CNTs. Optimizing this process requires a detailed understanding of both the mass balance and gas composition. In this work, CNTs were synthesized by chemical vapor deposition (CVD) from low-density polyethylene (LDPE), high-density polyethylene (HDPE), and polypropylene (PP) using a nickel–iron (NiFe) catalyst (synthesis details presented elsewhere [1]). The experiments were performed in a one-chamber reactor, with 1 g of plastic loaded in the upper zone (400–450 °C) and 0.2 g of NiFe in the lower zone (850 °C). The system was heated for 1 h and then held for 0.5 h under a N_2 flow (50 cm^3 min^{-1}). Generated gases were analyzed *in situ* by gas chromatography with flame ionization detection (GC-FID). After reaction, solid and liquid fractions were collected and weighed. Characterization of similar CNTs can be consulted in previous publications [1-3]. The results are summarized in Fig. 1. As shown in Fig. 1a, the solid fraction yields were similar for all polymers (35–38%), while HDPE produced a higher liquid fraction than LDPE and PP. The gas fraction dominated in all cases, suggesting catalyst deactivation or an inadequate catalyst-to-plastic ratio. Three major gases were detected (Fig. 1b): methane >> propylene > ethylene. LDPE and PP showed comparable gas distributions, whereas HDPE generated markedly less methane and propylene, consistent with the mass balance trends.

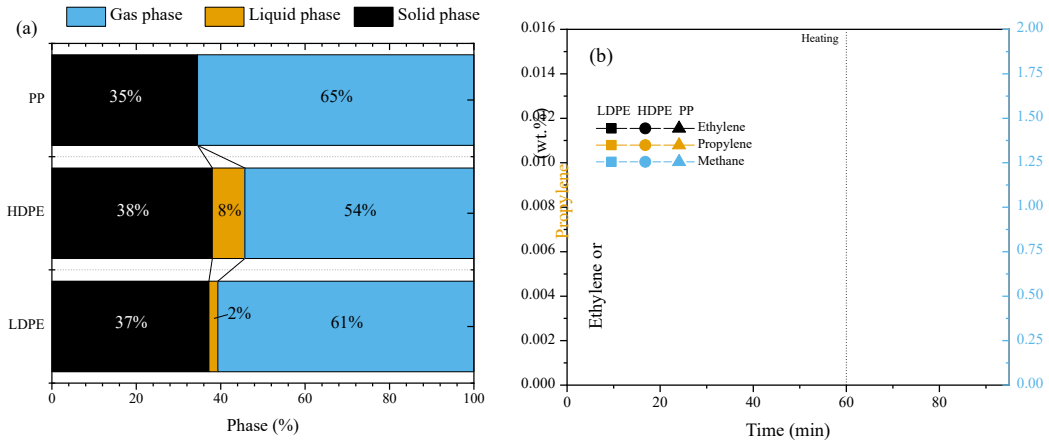

Fig.1. (a) Mass balance and (b) gas phase composition.

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Referências

[1] F.F. Roman, M. C. Batista, A.S. Silva, A.J.B. Bezerra, *et al*. ChemCatChem, 17 (2025) e202500233.
[2] A.S. Silva, F.F. Roman, J.L. Diaz de Tuesta, *et al*. ChemCatChem, 17 (2025) e202500438.
[3] F.F. Roman, A.S. Silva, *et al*. Journal of Environmental Chemical Engineering, 13 (2025) 115206.