Background / Context： Chemical recycling of polyolefin waste is constrained by the need for highly purified waste plastics pyrolysis oils (WPPO), as conventional steam cracking and co-processing routes are sensitive to contaminants and deliver limited olefin yields.

Objective： We present a catalytic chemical recycling route that directly converts WPPO into light olefins using a proprietary zeolite catalyst, enabling higher yields from lower-quality feedstocks.

Main Content / Innovation： Unlike the prevailing co-cracking approach with naphtha, our process selectively cracks WPPO to produce light olefins including ethylene and propylene, while also generating BTX as valuable co-products. Bench-scale results demonstrate olefin yields exceeding 60%, highlighting the intrinsic efficiency of the catalytic pathway (TRL 4–5). The catalyst system exhibits high tolerance to heteroatom impurities (O, N, Cl), reducing the need for extensive feedstock upgrading and enabling the use of lower-grade WPPO.

Conclusion / Takeaway： This technology expands feedstock flexibility while significantly improving olefin recovery, strengthening both economic performance and compliance with evolving European mass-balance frameworks, including potential “fuel-use exclusion” rules.