Polychlorinated biphenyls (PCBs), manufactured until mid-1970's for use as electrical insulators, were banned in 1979 due to their toxicity and persistence in the environment (1). Dechlorination of PCBs using bimetallic systems is a promising technology wherein enhanced corrosion of a reactive metal is combined with catalytic hydrogenation properties of a noble metal to drive the reduction of PCBs at the bimetallic interface (2). Pd/Fe bimetallic systems have been demonstrated to completely dechlorinate trichloroethylenes (3) and PCBs (4). Mg has an oxidation potential of 2.372 V that is significantly higher than 0.44 V of Fe (5), and thus a greater force to drive the hydrodehalogenation reaction (6). The high oxidation potential of Mg, coupled with its natural abundance, low cost and environmentally friendly nature has led to growing interest in Mg-based dechlorination systems. Hence, the primary objective of this study was to evaluate Mg as a substrate in Pd-doped bimetallic particles for dechlorinating PCB matrices.