

CHAPTER I

INTRODUCTION

In this decade, after historically using alkanes as a fuel, the demands for polymer materials have led industry to find the way to use light alkanes for production of ethylene and propylene. The processed catalytic dehydrogenation of lower alkanes was developed for this propose.

For the dehydrogenation process, the literature mentions three types of catalyst : chromia, sulfided nickel, and noble metal catalysts (Resasco et al., 1994). In Thailand, the first petrochemical complex has a dehydrogenation plant using UOP technology (OLEFLEX), with a nobel metal catalyst (Pt-Sn on supported Al_2O_3) (Pramote, 1993).

This project is complementary to the project on propane dehydrogenation over Pt-Sn catalyst. Here the decoking performance is considered. Many articles refer to catalyst regeneration that can apply to the Pt-Sn propane dehydrogenation catalyst. Paul, (1960) indicated the amount of oxygen content in the efflux gas to be normally 0.5 to 2 percent to prevent catalyst sintering. Coking formation studies by Beltrimini et al., 1985 identify coke occurring on both metal surface and support. It has also been determined that removal of coke from the support does not affect the dehydrogenation activity. The important requirement for recovery of activity depends on the coke on the metal surface sites. Borio et al., 1992 indicate that maximum temperatures allowable, oxygen concentration and the extent of the regeneration can strongly influence the global optimum.

For catalyst regeneration performance, Parera et al., (1989, 1992, 1994) studied the change of coke during regeneration with time. Many workers have also studied the effect of promoters (Sn) on the dehydrogenation catalyst behavior but there is little literature on the promoters function during the regeneration procedure.