

## Selective Preparation of 2-Adamantanone by Photocatalytic Oxidation of Adamantane

송선정, 김경석<sup>1</sup>, 김경환<sup>1</sup>, 조동련<sup>1,\*</sup>  
전남대학교 BK21 기능성나노신화학소재사업단;  
<sup>1</sup>전남대학교 신화학소재공학과 BK21  
(dlcho@chonnam.ac.kr\*)

2-Adamantanone is a useful compound for various pharmaceuticals and optical materials. However, it is difficult to selectively produce the 2-damantanone since it can be only prepared by oxidation of adamantane. Among various oxidation processes, only one process in which adamantane is reacted with concentrated sulfuric acid at an elevated temperature was adapted as a commercial process. However, conversion is not so high and separation and refinement of the products is still required. In this study, improvement of the oxidation process has been attempted by using heterogeneous oxidative catalyst, TiO<sub>2</sub> powders, to selectively produce 2-adamantanone. Photocatalytic oxidations of adamantane were carried out with three types of TiO<sub>2</sub> powders: PC-500 (anatase 100%, Millennium Co.); P-25 (anatase 75%, Degussa Co.); and RT-1 (anatase 0%, Photo & Environmental Technology Co.). 30% H<sub>2</sub>O<sub>2</sub> or O<sub>3</sub> was used as an oxidant. It was also investigated the temperature and solvent dependence on the conversion and selectivity for 2-adamantanone during irradiation. The best results were obtained when rutile TiO<sub>2</sub> powders was used in acetic acid reflux temperature with H<sub>2</sub>O<sub>2</sub>.