

Photocatalytic hydrogen production from water-methanol mixtures over Pt/Ru<sub>2</sub>O/  
PbBi<sub>2</sub>Nb<sub>2</sub>O<sub>9</sub> under visible light irradiation ( $\lambda > 420$  nm)

김현규<sup>1,\*</sup>, 정의덕<sup>1</sup>, 김해진<sup>2</sup>, 박혁규<sup>1,3</sup>, 홍석준<sup>4</sup>, 지상민<sup>4</sup>,

배상원<sup>4</sup>, 장점석<sup>4</sup>, 이재성<sup>4</sup>

<sup>1</sup>한국기초과학지원연구원 부산센터;

<sup>2</sup>한국기초과학지원연구원 미래융합연구실;

<sup>3</sup>부산대학교 물리학과; <sup>4</sup>포항공과대학교 화학공학과

(hngkim@kbsi.re.kr\*)

Perovskite-type oxide materials based on transition metals with d(0) electron configuration such as NbV, TaV, and TiIV are efficient photocatalysts for overall water splitting with high quantum yields. Very recently, we have succeeded in fabricating an undoped, a single-phase oxide photocatalyst, PbBi<sub>2</sub>Nb<sub>2</sub>O<sub>9</sub>, an Aurivillius-phase perovskite, which is an efficient photocatalyst for decomposition of water into O<sub>2</sub> or H<sub>2</sub> under visible light irradiation. We also have succeeded in fabricating a novel configuration of composite solids designated as photocatalytic nanodiodes (PCD) formed by p- and n-type semiconductors. Here we report Photocatalytic hydrogen production from water-methanol mixtures over Pt/Ru<sub>2</sub>O/PbBi<sub>2</sub>Nb<sub>2</sub>O<sub>9</sub> under visible light irradiation ( $\lambda > 420$  nm).