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Correction: Influence of Cu doping on the visible-light-induced photocatalytic activity of $InVO_4$

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Correction for 'Influence of Cu doping on the visible-light-induced photocatalytic activity of $InVO_4$' by Natda Wetchakun *et al.*, *RSC Adv.*, 2017, **7**, 13911–13918, DOI: 10.1039/C6RA27138C.

The authors regret errors in Fig. 4, 7, and 9 in the previously published article. The corrections for the errors in the article are described as follows:

(1) The diffuse reflectance spectra of pure $InVO_4$ and 1.0 mol% Cu-doped $InVO_4$ are shown in Fig. 4. The absorption margin of 1.0 mol% Cu-doped $InVO_4$ was shifted to a longer wavelength, indicating a decrease in the band gap with respect to pure $InVO_4$. The absorption margins of the pure $InVO_4$ and 1.0 mol% Cu-doped $InVO_4$ samples were 505 nm and 510 nm, corresponding to band gaps of 2.51 eV and 2.45 eV, respectively (Fig. 4a and b).

(2) The band edge positions of the conduction band (CB) and the valence band (VB) of $InVO_4$ can be calculated by the following equation: $E^0_{CB} = \chi - E^C - 0.5E_g$,[1] where χ is the electronegativity of the semiconductor, E^C is the energy of free electrons on the hydrogen scale of 4.5 eV, E_g is the band gap of $InVO_4$, and the χ value of $InVO_4$ is 5.74 eV.[2] The E_g value of $InVO_4$ evaluated from the UV-vis DRS analysis was about 2.51 eV. The valence band energy (E_{VB}) can be calculated by the following equation:[3] $E_{VB} = E_{CB} + E_g$, where E_{CB} is the conduction band energy. Based on the equation above, the calculated CB and VB edge potentials of $InVO_4$ were −0.02 eV and 2.49 eV, respectively. Now, we are in a position to discuss the photocatalytic mechanism of Cu-doped $InVO_4$ for MB degradation (Fig. 7). In the photocatalysis process, when the absorbed photon energy ($h\nu$) equals or exceeds the band gap, the Cu-doped $InVO_4$ generates electron–hole (e^-/h^+) pairs. In that case, the generated electrons from the valence band can be transferred to the conduction band of $InVO_4$. Since the CB edge potential of $InVO_4$ (−0.02 eV) is higher than the standard redox potential, $E^0(O_2/O_2^{\bullet-}) = -0.33$ V *vs.* NHE at pH 7, this suggests that the electrons in the CB of $InVO_4$ cannot reduce O_2 to the superoxide

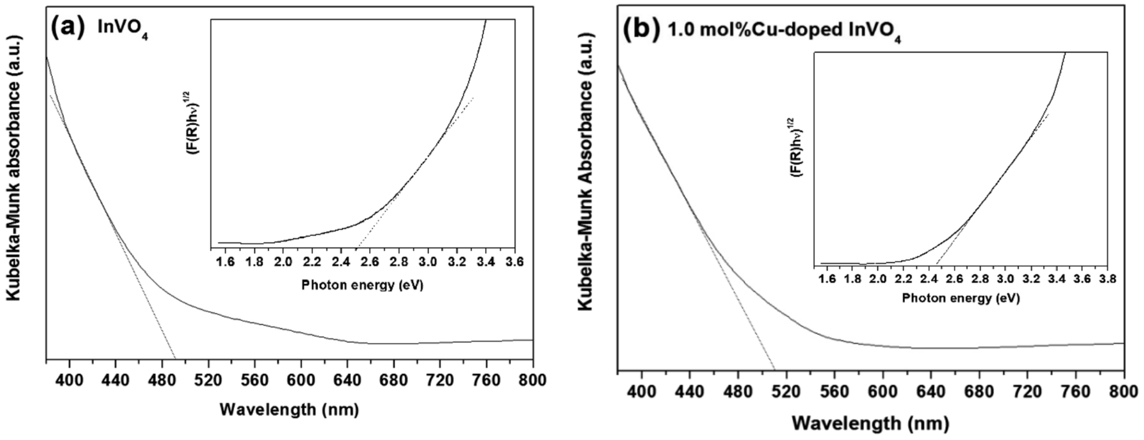

Fig. 4 Kubelka–Munk absorbance spectra and band gaps (insets) of the pure $InVO_4$ (a) and 1.0 mol% Cu-doped $InVO_4$ (b) samples.

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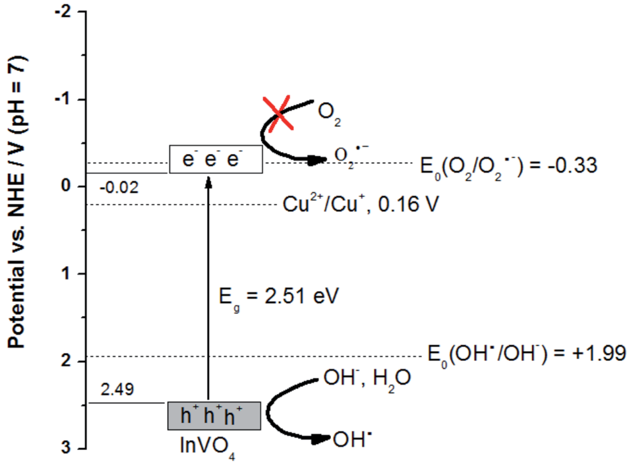

Fig. 7 Schematic of the charge migration and separation on Cu-doped $InVO_4$.

radical ion ($O_2^{\bullet -}$). In addition, the VB of $InVO_4$ (2.49 eV) is higher than the standard redox potential, $E^0(OH^-/OH^\bullet) = 1.99$ V *vs.* NHE at pH 7. This indicates that the photogenerated holes in the valence band of $InVO_4$ can oxidize the hydroxyl ion (OH^-) or water (H_2O) to form the hydroxyl radical ($OH^\bullet$).

(3) Due to the contradiction between the scavenging test and the proposed photocatalytic mechanism, Fig. 9 was removed from the original article.

The Royal Society of Chemistry apologises for these errors and any consequent inconvenience to authors and readers.

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