

EFFECTS OF SOL-AGING ON THE STRUCTURAL
AND CATALYTIC PROPERTIES OF ANATASE
THIN FILMS

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Aging Effects of the precursor solution on the structural and catalytic properties of anatase phase TiO₂ thin films were investigated. Crystallographic orientation of thin films, which had been determined using x-ray diffraction, was affected by the aging time and the intensity ratio of (004) peak to (101) peak was 0.2 and 2.5 for the thin films from aged and fresh coating solution, respectively. Catalytic properties of thin films were also affected by the aging time of coating solution and the resulting crystallographic orientation. Photocatalytic properties of thin films from aged sol were better than those from the fresh sol and decomposition of phenol could be enhanced by applying DC bias as shown in figure 1. Figure 2 shows the photocurrent of two kinds of thin films under applied bias. Enhanced photo-activity under applied bias was understood to originate from the large photocurrent and thin films with preferred orientation from fresh sol were more sensitive to the applied bias, which might be correlated with the sensitivity of photocatalytic properties to the applied bias.

Keywords : aging, photocatalysis, anatase, TiO₂,
orientation, photocurrent

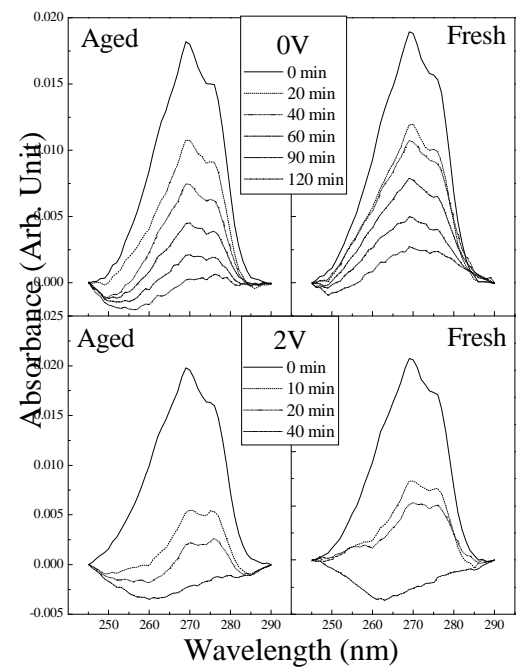


Fig. 1. Photocatalytic properties of TiO₂ thin films under various conditions

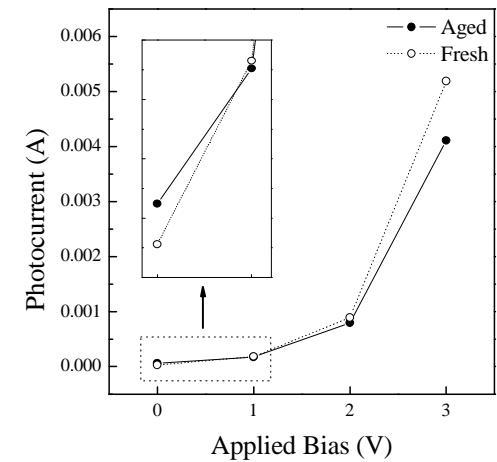


Fig. 2. Photocurrent of TiO₂ thin films under various applied bias