

Abstract Submitted
for the MAR10 Meeting of
The American Physical Society

Home-made experiment of Dye-sensitized TiO₂ Nanocrystalline Solar Cells and its education evaluation¹ M.F. TAI, M.C. SHIEH, T.W. CHEN, Department of Physics, National Tsing Hua University — Dyes extracted from some natural fruits including anthocyanins absorb sunlight and effectively activate electrons of anthocyanins. Thus these activated electrons are conducted between TiO₂ nanocrystals and form electric potential and current between two electrodes. The dyes can be gotten from the natural fruits, such as blackberries, raspberry, pomegranate seeds and bing cherries. This principle permits making a dye sensitized TiO₂ nanocrystalline solar cell (DSSC). All required materials and tools for fabricating a home-made DSSC are easy to obtain around home. The procedures are perfect hands-on experiment as well as demonstration in K-12 schools or home settings. We have designed several protocols for fabricating DSSC and have successfully demonstrated in more than 100 activities with different level students. K-12 Students were able to build their own working DSSC's within 2-3 hours sessions and learned about alternative energy sources. These experiments can inspire students and general public about the modern technology in daily life. Low cost (low than US \$3 in Taiwan) and safety are also ensured in our DSSC experiments.

¹Supported by Grant No. NSC 98-2515-S-007-005 and NSC 97-2515-S-007 -005 of National Science Council of Republic of China, Republic of China.

M.F. Tai
Department of Physics, National Tsing Hua University

Date submitted: 30 Nov 2009

Electronic form version 1.4