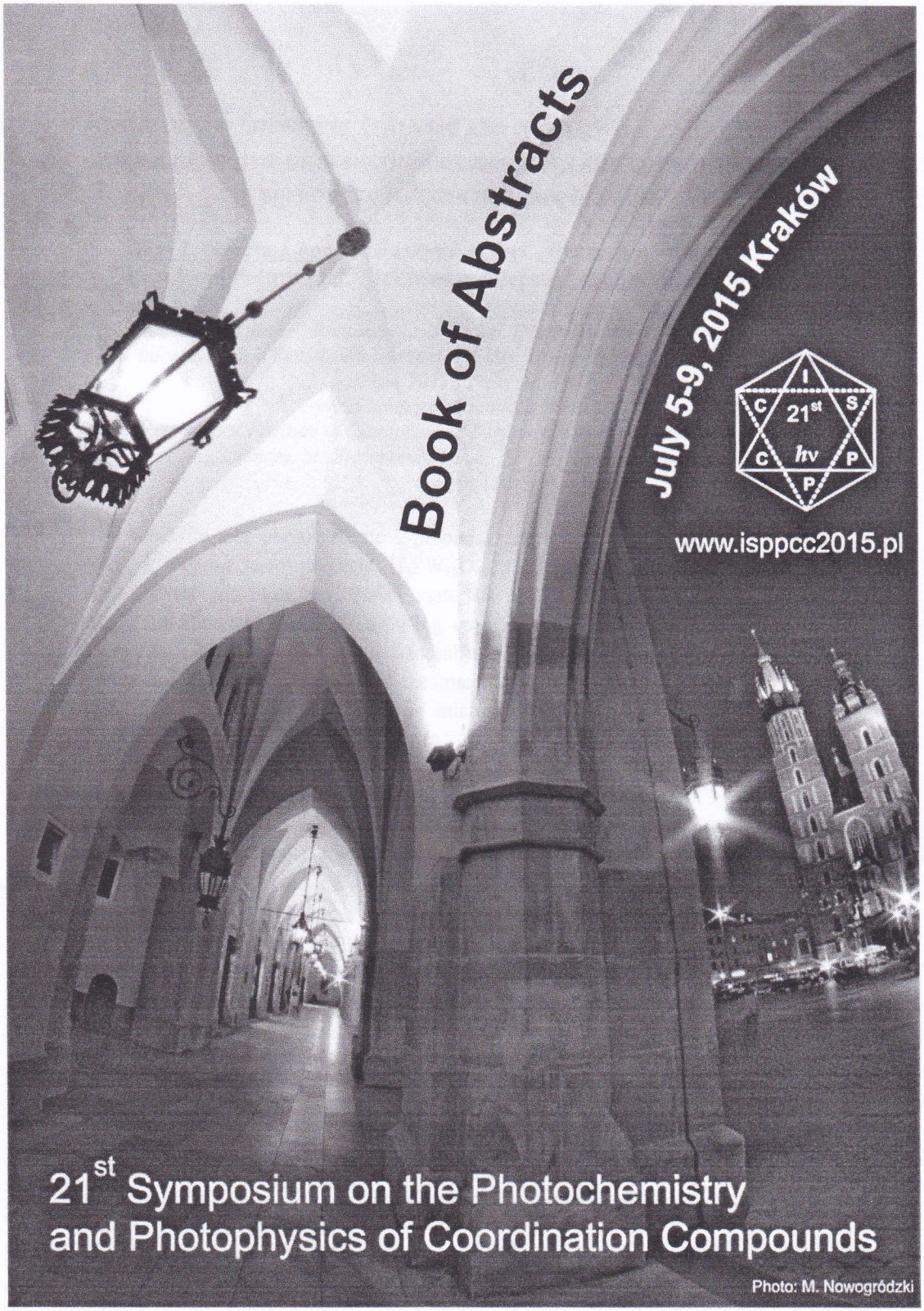
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COMPARISON BETWEEN CATALYTIC AND PHOTOCATALYTIC ACTIVITY IN GAS-SOLID REGIME OF SEMICONDUCTOR OXIDES AND CARBON NANOTUBES SUPPORTED KEGGIN HETEROPOLYACID

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Catalytic and photocatalytic 2-propanol dehydration has been carried out by using a Keggin heteropolyacid $H_3PW_{12}O_{40}$ supported on SiO_2, TiO_2, ZrO_2 and multiwall carbon nanotubes. Binary materials have been prepared by impregnation and/or solvothermal treatment by using commercial supports: SiO_2 (Mallinckrodt), TiO_2 (Evonik P25) and carbon nanotubes (Sunnano) or home solvothermically prepared SiO_2, TiO_2 or ZrO_2. All the materials have been characterized by X-ray diffraction (XRD), scanning electron microscopy observations (SEM) with EDX microanalysis, specific surface area measurements and diffuse reflectance spectroscopy (DRS). The retention of Keggin anion structure throughout the synthesis of catalysts was confirmed both by FTIR and Raman spectroscopy.

(Photo)catalytic 2-propanol dehydration was studied in gas-solid regime both by using a continuous (photo)reactor working at atmospheric pressure and 80°C, but also by recording the IR spectra (from room temperature to 150°C) of the gas-phase over the HPA-support composites where the 2-propanol has been previously adsorbed. For the photo-assisted runs the reactor was also illuminated from the top with UV LEDs at different irradiances. Propene and diisopropyl ether were the main observed reaction products, however significant differences have been observed between the different supported materials. The Keggin heteropolyacid species played a key role both for the catalytic and the photo-assisted catalytic reactions.