

Hydrogen storage using polymer-supported organometallic dihydrogen complexes: a mechanistic study

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† (i) Sample preparation: PE films (250 μm thickness) were formed by hot pressing as described previously.¹⁶ $\text{W}(\text{CO})_6$ was impregnated into the PE films by impregnating the films with *n*-pentane solutions of the organometallic at ambient temperature followed by drying under vacuum (ii) Photolytic reactions: All reactions were carried out in a high pressure cryogenic cell equipped with CaF_2 view windows, as described previously.^{16,17} Photolysis was carried out using a Philips HPK 125 W medium pressure Hg arc lamp equipped with a >300 nm filter.

‡ LDPE was used in this experiment: although this is known to have alkene residues which react with $\text{W}(\text{CO})_5$ at higher temperatures (230 K)¹⁸ it seems that the mobility of the complex / polymer at 21 K is too low to allow this reaction to occur. For all other experiments Hostalen Gur PE was used which is free of alkene functionalities but which can stabilize the 16-electron $\text{W}(\text{CO})_5$ complex at temperatures as high as 90 K, presumably by weak van der Waals interactions of the vacant ligand site with the PE chains.

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