Electronic Supplementary Information (ESI) for Dalton Transactions

Monolithic porous magnesium silicide

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Table ESI 1: N_2 sorption and PXRD data of different Mg_2Si samples at synthesis conditions as indicated with porous Si as precursor (samples with "Si44µ" labeled derive from commercial Si powder)

	SA $_{BET}$ (m^2g^{-1})	Crystallite size of Mg_2Si^* (2 2 0) [nm]	Crystallite size of Si^* (1 1 1) [nm]
Magnesium silicide_650 °C_30min	<50	100	---
Magnesium silicide_650 °C_2 h	<50	116	---
Magnesium silicide_650 °C_5 h	<50	140	---
Magnesium silicide_600 °C_2 h	<50	128	25^{**}
Magnesium silicide_600 °C_5 h	<50	130	---
Magnesium silicide_700 °C_30min	<50	101	---
Magnesium silicide_700 °C_2 h	<50	151	---
Magnesium silicide_Si44µ_650 °C_30min	<50	544	442^{***}
Magnesium silicide_Si44µ_650 °C_2 h	<50	248	1800^{****}

* Rietveld refinement; ** 7% silicon, 93 % Mg_2Si; *** 7% silicon, 93 % Mg_2Si; **** 1% silicon, 99 % Mg_2Si

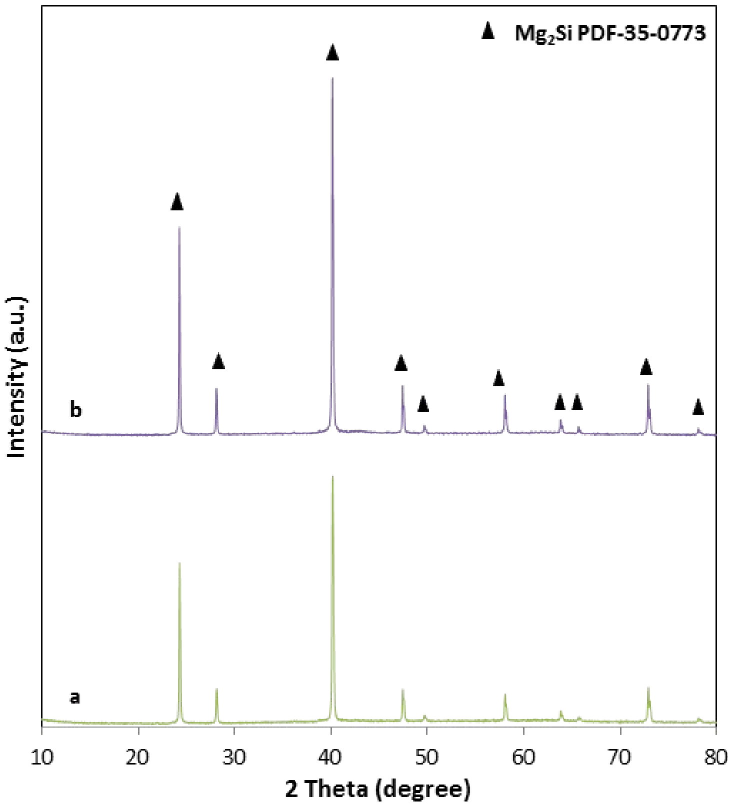

Fig. ESI 1: XRD pattern of Mg_2Si samples with different reaction holding time (a) 650 °C - 2h; (b) 650 °C - 5h

The original silica monolith exhibits a type IV isotherm with H1-type hysteresis loop supporting the mesoporous character of the sample with a monomodal pore size distribution (Fig. ESI 2). Upon removal of MgO after HCl treatment, mixed isotherms of type II and IV with a H1 hysteresis loop (Fig. ESI 2) in the mesoporous region are obtained, indicating the presence of meso- and macroporous silicon. Washing with HF leads to a type II isotherm with a H1 hysteresis loop (Fig. ESI 2). For monolithic porous Mg_2Si, the N_2 isotherm shows a low amount of adsorbed nitrogen with no distinct hysteresis anymore. Therefore, pore size distributions will not give any reliable results.

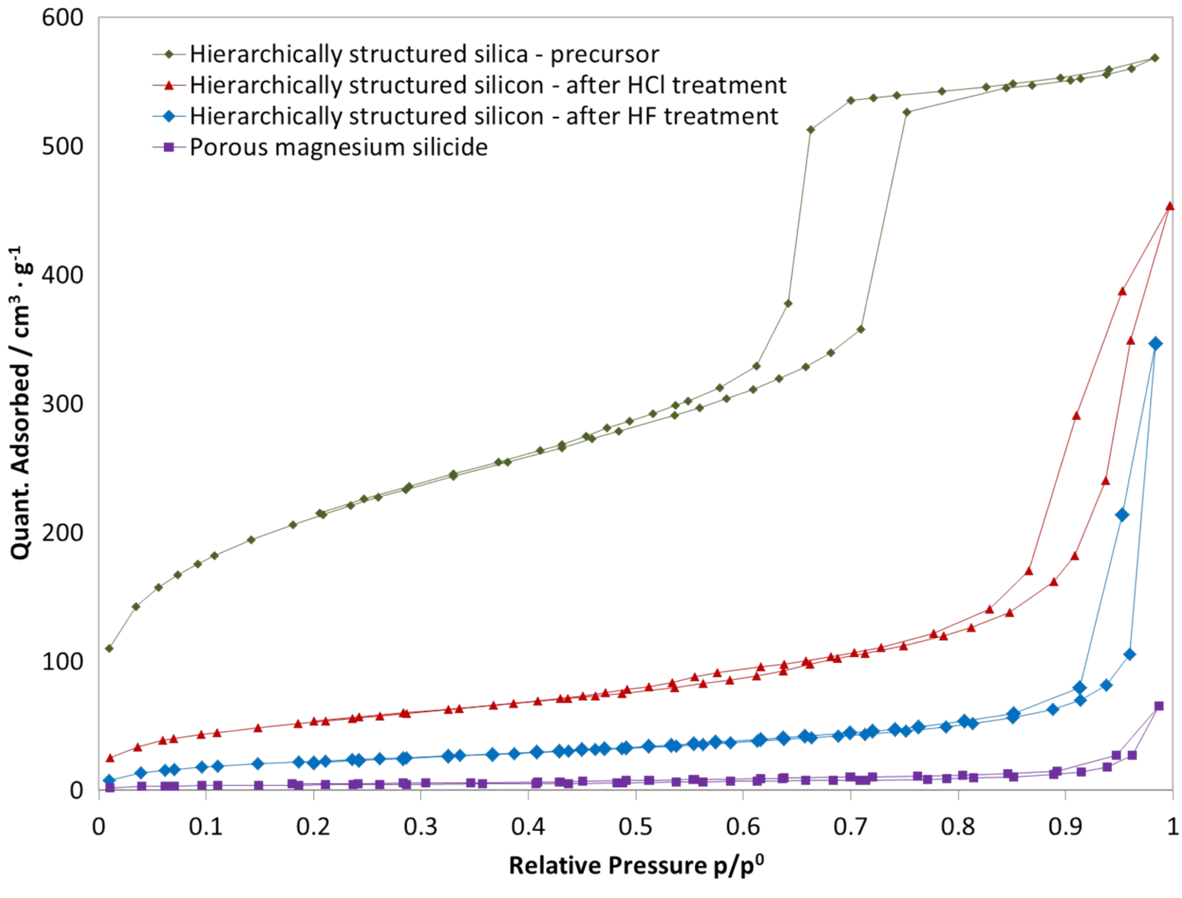

Fig. ESI 2- N_2 sorption isotherms of precursor, intermediate and final products