Supporting information

Bringing attention to metal (un)availability in encapsulated catalysts

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Table S1. Reported porosity of the encapsulated structures (References given in the main text)

	Structure	BET surface area (m^2g^{-1})	Pore volume mLg^{-1}	Mean pore diameter (nm)	Method/Surfactant	Ref.
2003	$Au@SiO_2$	690	0.53	3.14	Hexadecyltrimethylammonium bromide (CTAB)	Nooney[25]
2004	$Zr,Ti,Fe@SiO_2$	1028-1155	1.17-1.95	2.1-2.4	CTAB, highly acidic	Chao [26]
2008	Au@SiO2	200-300	0.25, 0.27	1.5, 12	Surface-protected etching	Yin [27]
2008	$Pd@SiO_2$	104	-	<4	PVP	Li [13]
2009	Pt@SiO2	440	-	2.3	Tetradecyltrimethyl ammonium bromide (TTAB)	Joo [9]
2010	$Pd@SiO_2$	185	0.5		Igepal CO560	Forman [28]
2010	$SiO_2/Pt@SiO_2$	113	0.27	13.2	Surface-protected etching	Yin [20]
2010	SiO2/Pd/SiO2	115	0.31	15	Surface-protected Etching	Wang [29]
2010	$Ni@SiO_2$	195	0.38	-	igepal CO-630/C18TMS	Park [30]
2012	$Ni@SiO_2$	117	0.125	3-4	PVP(K30)	Li [21]
2012	SiO_2/Pd/hollow ZrO_2	27	0.17	2.3	PVP/(3-Aminopropyl)triethoxysilaneAPTES(APTES) /Brij30	Wang [31]
2012	$AlMgO/SiO_2$	456	0.43	3.5	CTAB	Wang[32]
2012	$SiO_2/Pd@SiO_2$	400	0.23	1.5	PVP/ Dodecyltrimethylammonium chloride (DTAC)	Yang[33]
2013	$Pt@SiO_2$	247	-	2-3	Tetraethyl orthosilicate (TEOS) + Trimethoxy(octadecyl)silane (C18TMS)/CTAB	He [34]
2013	$SiO_2/Pt@SiO_2$	448-662	0.39-0.55	2.4-2.6	SiO_2/Pt+CTAB, SiO_2	Xiao [35]

2013	$Pd@SiO_2$	171	-	3.2	One pot hydrothermal synthesis	Tan [36]
2013	$Pd@SiO_2$	948	1.6	2.2	TTAB	Hu[17]
2013	$Pd@SiO_2$	401	-	1.1	PVP	Oh [22]
2013	$Pd@SiO_2$	459, 530	1.8, 2.3	2.5	Oleylamine-capped Pd	Xu [37]
2013	$Au@SiO_2$	561	0.524	2.5	CTAB (one pot)	Chen [38]
2013	$Ag\text{-}Au@SiO_2$	1331	-	2.0	CTAB/Galvanic replacement	Soule [16]
2013	$Cu\text{-}Ni@SiO_2$	146	-	-	CTAB	Wu[39]
2014	$Mn_3O_4@SiO_2$	500-700	-	2-4	CTAB	Xu [40]
2014	$SiO_2@Pt@SiO_2$	24	-	-	PVP	Somorjai [10]
2014	$AuPd@SiO_2$	190-215	-	1.5-3	Thiol-protected	Samanta [41]
2014	$Pd@SiO_2$	323	0.402,0.086	-	PVP	Kim [15]
2014	$Pt@SiO_2$	64	-	30	PS-b-PVP-b-PEO triblock copolymer	Bastakoti [42]
2015	$Pd@SiO_2$	489	1.05	19.4	Block copolymer	Guang-Li [43]
2015	$PdONiO@mSiO_2$	790	1.1	2.2	TTAB	Liu [44]
2015	Pt@Hollow SiO_2	721	0.33	3.5	Hollow SiO_2 using carbon spheres	Zhang [24]
2015	$Au@SiO_2$	41.5	-	3, 60	PVP+CTAB	Zhang [45]
2015	$Fe_3O_4@SiO_2@mSiO_2$	396	0.54	2.7 and 10.3	Cetyltrimethylammonium chloride solution (CTAC)	Yang [46]
2015	$Pt@SiO_2$	480	-	1.9	CTAB	Wang [47]
2015	Pd@MCM41	935	-	3-3.3	CTAB	Lin [48]
2015	$AgPd@SiO_2$	533	-	1.4	Thiol-protected	Mondal [49]
2015	$CeNiO@SiO_2$	80-179	0.16-0.43	7.4-11.6	PVP	Zhang[23]
2015	$Pd@SiO_2$	254	0.24	2.9	CTAB	Martins[50]
2015	$Pd@SiO_2$	302-406	1.03	6	CTAC	Shen [51]
2016	$Pd@SiO_2$	383	1.5	8.9	CTAB	Ying[52]
2016	$Pd@SiO_2$	335	0.56	-	PVP	Seo [53]
2017	Au@Silica	70	Micro:0.0092 Meso:0.111	9	Mercaptoundecanoic acid (MUA)	Sudheeshkumar[54]
2017	$Pd@SiO_2$	51-70	0.167-0.195	-	PVP during reduction, no porogen	This work
2017	$Pd@mSiO_2$	610-764	0.347-0.403	3.4	PVP during reduction and CTAB during encapsulation	This work

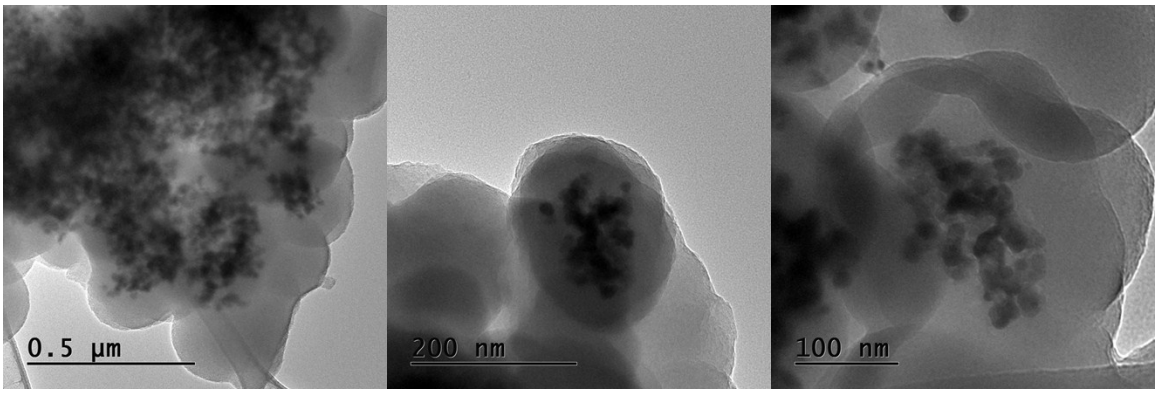

Fig. S1. 5 wt.% Porous Pd@mSilica prepared using CTAB-stabilized Pd NP's reduced by $NaBH_4$, separated using centrifugation. 1 g CTAB was added as a pore-inducing agent right before Stöber step. The catalyst was porous but the conversion was extremely low due to agglomeration of the core NPs.