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APPENDICES

Appendix A Raw Data

The temperature programmed reduction raw data of Pd-MCM-48 catalysts are summarized in Table A1.

Table A1 TPR results

Sample	Peak	Start [min]	Stop [min]	Maximum [min]	T [°C]	Integral [mVs]	[%]
1%Pd-MCM-48	1	7.3	16.767	10.367	133	13057.06	100
3%Pd-MCM-48	1	5.8667	10.25	6.8833	97	818.84	9.72
	2	7.5333	15.7833	10.5	133	7607.3	90.28
5%Pd-MCM-48	1	5.3667	10.8333	6.8833	100	13793.89	82.19
	2	7.6833	15.45	11.45	147	2989.48	17.81

Appendix B Calculation of Pd Loaded on MCM-48

1% Pd-MCM-48

1 wt% of Pd loaded on 0.3 g MCM-48

$$1\%Pd = \frac{x}{0.3 + x} \times 100$$

$$x = 3.03 \times 10^{-3} \text{ gPd}$$

10%Pd in Pd(NO₃)₂ solution

$$3.03 \times 10^{-3} \text{ gPd} \times \frac{100 \text{ gPd(NO}_2)_3}{10 \text{ gPd}}$$

$$\therefore \text{g Pd(NO}_3)_2 = 3.03 \times 10^{-2}$$

Density of Pd(NO₃)₂ = 1.118 g/cm³

$$D = \frac{m}{V}$$

$$V = \frac{3.03 \times 10^{-2} \text{ g}}{1.118 \text{ cm}^3}$$

$$V = 0.0271 \text{ cm}^3$$

MCM-48 support 0.3 g using Pd(NO₃)₂ 0.0271 cm³ for 1%Pd-MCM-48

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