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APPENDIX

APPENDIX A

SAMPLE CALCULATION OF CATALYST PREPARATION

The sample calculation shown below is for 0.04 wt% Pd/Al_3O_3 . The alumina support weight used for all preparations is 2 grams.

If X grams of alumina support is used; hence for each 100 grams of catalyst, the composition will be as follows:

Palladium	=	0.04	g.
Alumina support	=	X	g.
Then 0.04 + X	=	100	g.
Support (X)	=	99.96	g.

For 2 grams of alumina support:

Palladium required	=	2 x 0.04/99.96	g.
	=	8.003×10^{-4}	g.

Palladium nitrate 0.1 g. dissolved in de-ionized water with 0.4 ml. of Hydrochloric acid (concentration of HCl is 37 % volume by volume)

Then Pd content in stock solution	=	0.1 x 106.4/230.43
	=	0.046 g.

Palladium nitrate taken from stock solution

	=	8.003×10^{-4} x10/0.046
	=	0.17 ml.

Since the pore volume of the alumina support is 0.25 ml./g. and the total volume of impregnating solution which must be used is 2 ml. by the requirement of dry impregnation method, the de-ionized water is added until the volume of impregnating solution is 2 ml.

APPENDIX B

METAL ACTIVE SITE ON CATALYST CALCULATION

Let the weight of catalyst used = w g.

Height of CO peak after adsorption = A unit

Height of 0.18 ml. of standard CO peak = B unit

Amounts of CO adsorbed on catalyst = $B-A$ unit

Volume of CO adsorbed on catalyst = $(B-A)/B \times 0.18$ ml.

Volume of gas 1 mole at 30 °C = 24.86×10^3 ml.

Mole of CO adsorbed on catalyst = $(B-A) \times 0.18 / B \times 24.86 \times 10^3$ mole

Molecule of CO adsorbed on catalyst = $7.24 \times 10^{-6} (B-A)/B \times 6.02 \times 10^{23}$ molecule

Metal active site = $4.36 \times 10^{18} (B-A)/B$ molecule of CO/g. cat.

VITA

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