

Figure 3.1

FLOW SCHEMATIC OF 300cc AUTOCLAVE REACTOR

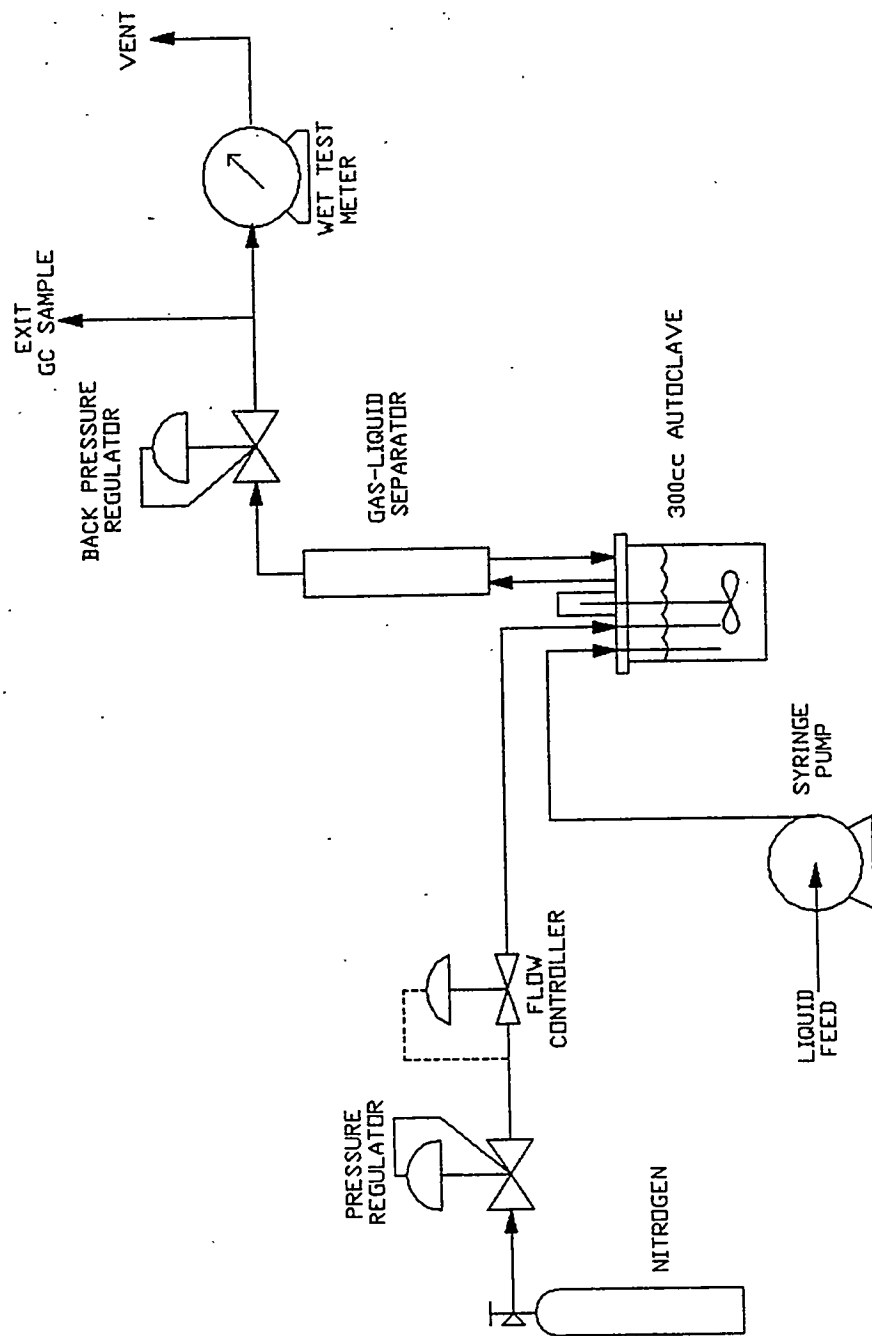


Figure 4.1.1: Effect of Temperature on Isobutanol conversion and Isobutene Yield

150 psig, GHSV=2500 sl/kg-hr, 5 mol% Isobutanol in N2

Run No.: 11782-88, 11782-92, 13033-9, 13033-12, 13033-14

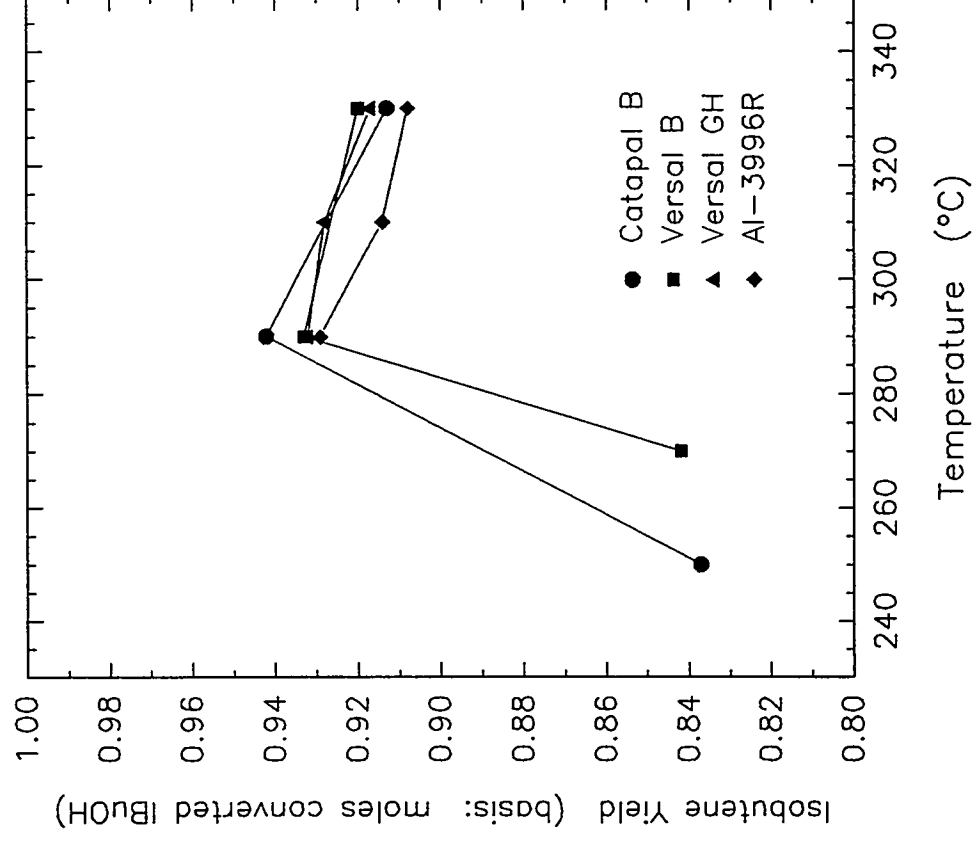
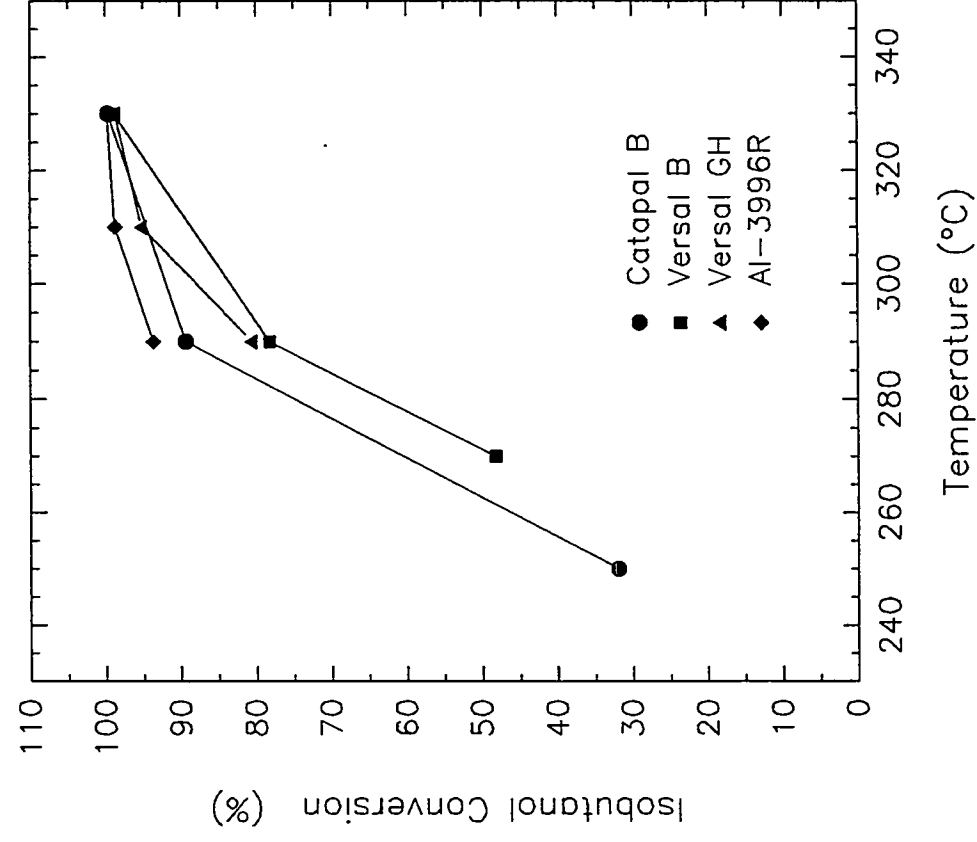


Figure 4.1.2: Yields of Linear Butenes and Diisobutyl Ether as a Function of Reactor Temperature

150 psig, GHSV=2500 sl/kg-hr, 5 mol% Isobutanol in N2

Run No.: 11782-88, 11782-92, 13033-9, 13033-12, 13033-14

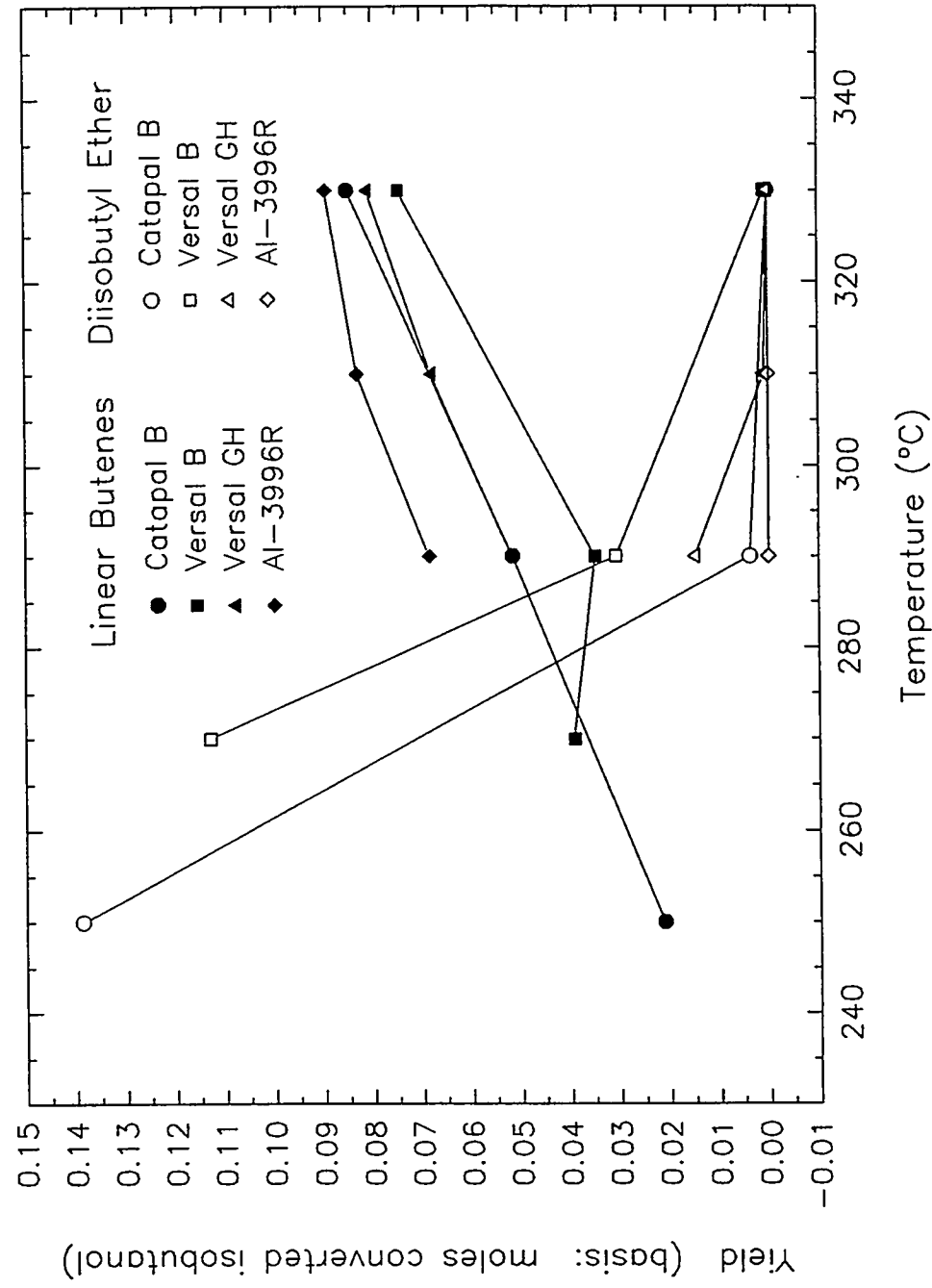


Figure 4.1.3: Effect of Pressure on Isobutanol conversion and Isobutene Yield at 290 °C

290 °C, GHSV=2500 sl/kg-hr, 5 mol% Isobutanol in N2

Run No.: 11782-88, 13033-9, 13033-12, 13033-14

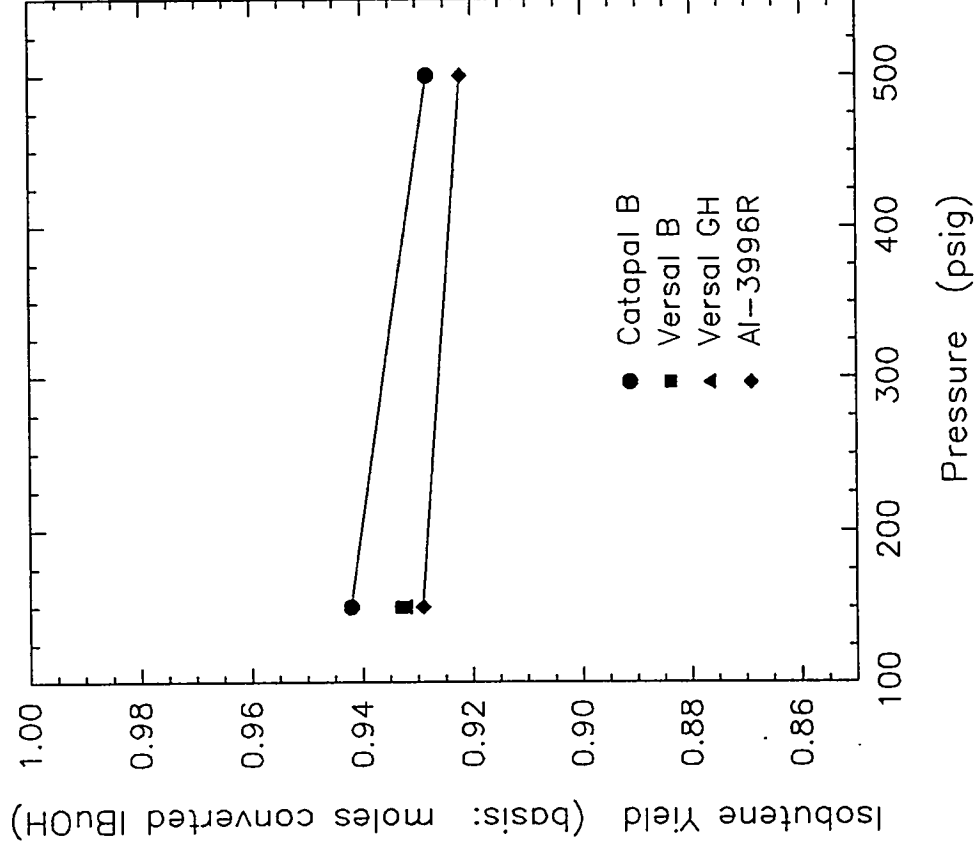
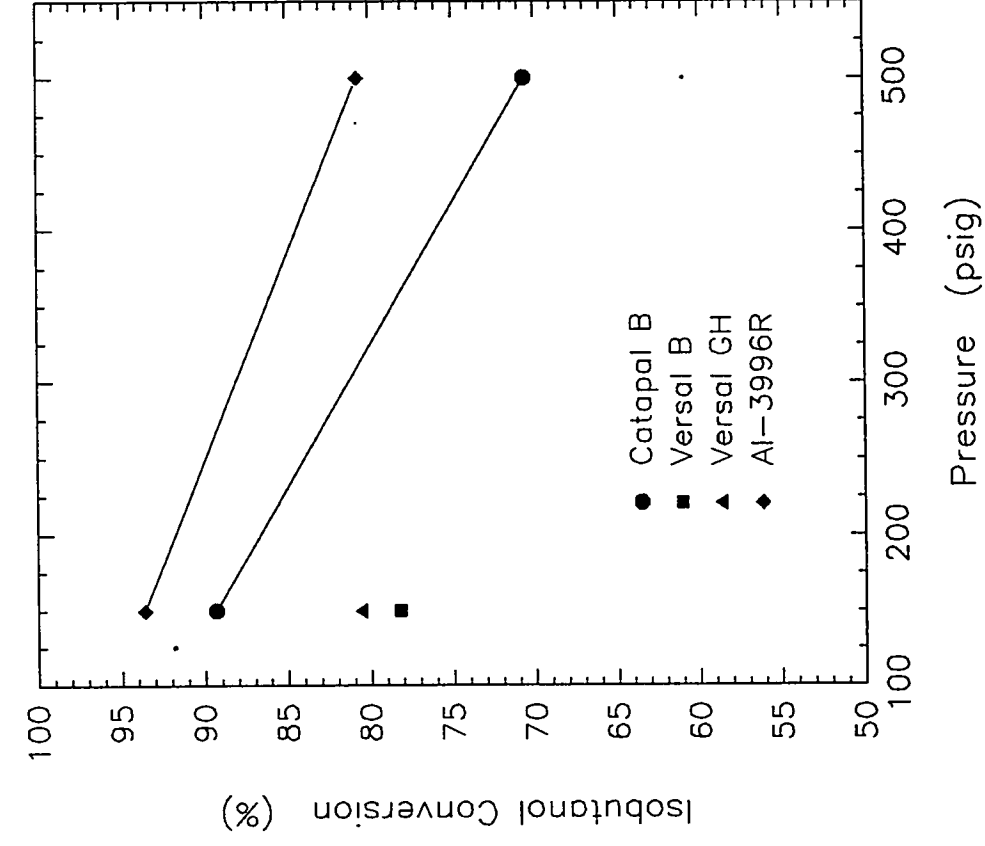


Figure 4.1.4: Effect of Pressure on Isobutanol conversion and Isobutene Yield as a Function of Temperature

GHSV=2500 sl/kg-hr, 5 mol% Isobutanol in N₂

Run No.: 11782-78, 11782-88, 13033-14

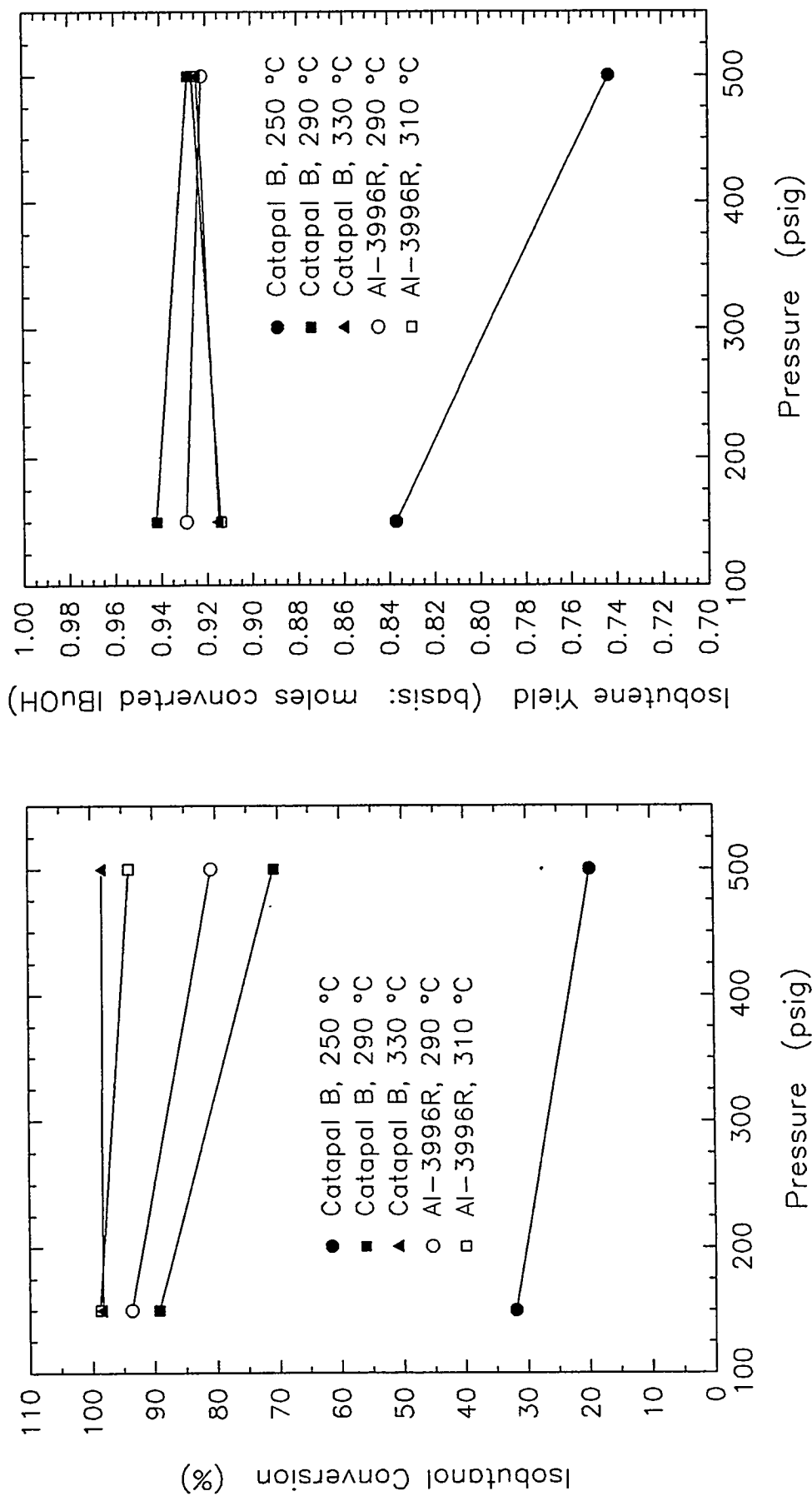


Figure 4.1.5: Effect of Gas Hourly Space Velocity on Isobutanol Conversion and Isobutene Yield at 290 °C

290 °C, 150 psig, 5 mol% Isobutanol in N2

Run No.: 11782-88, 13033-9, 13033-12, 13033-14

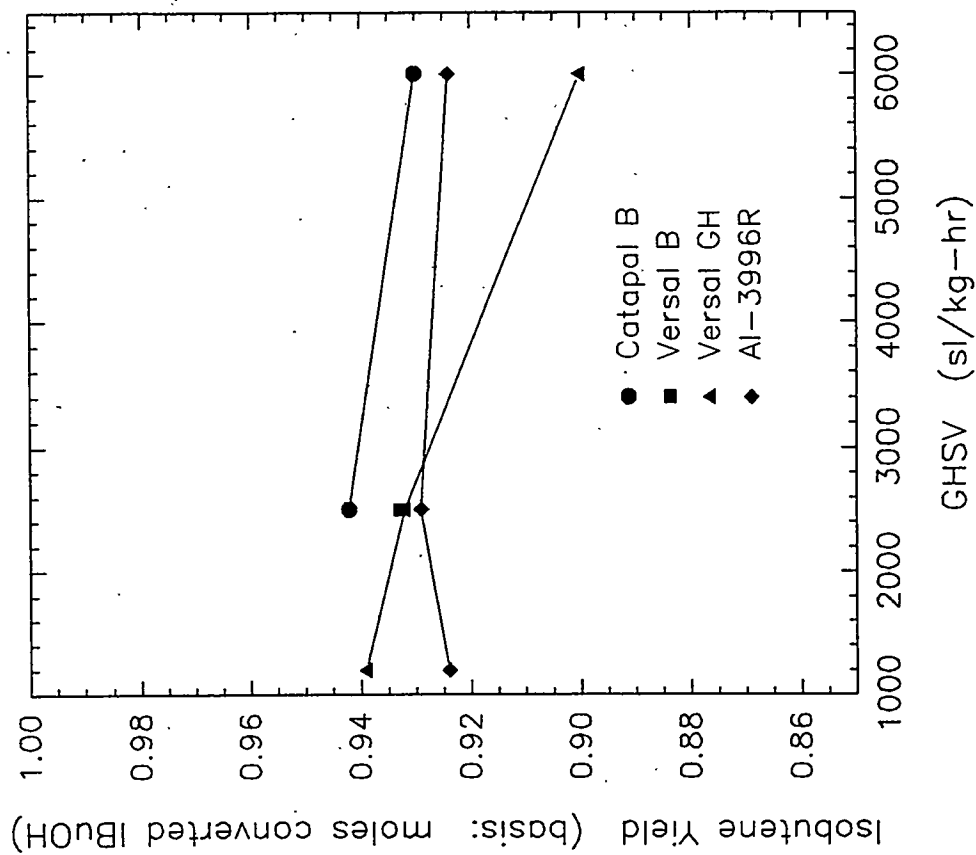
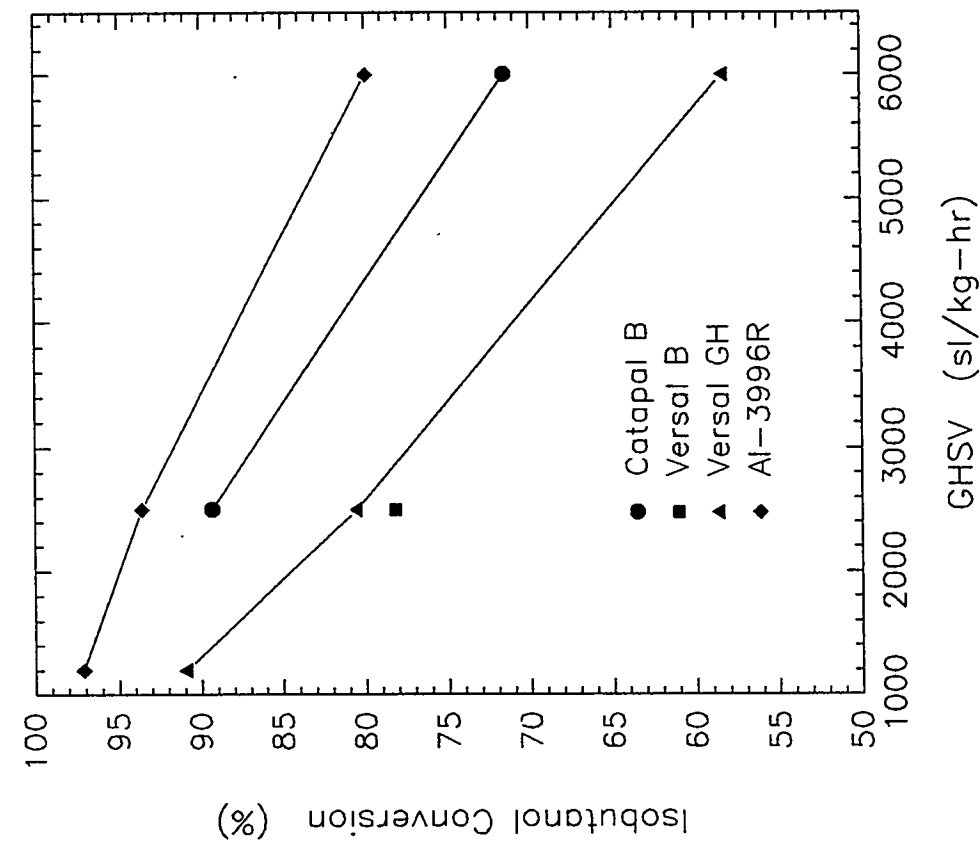


Figure 4.1.6: Effect of Gas Hourly Space Velocity on Isobutanol Conversion and Isobutene Yield at 330 °C

330 °C, 150 psig, 5 mol% Isobutanol in N₂

Run No.: 11782-88, 11782-92, 13033-12, 13033-14

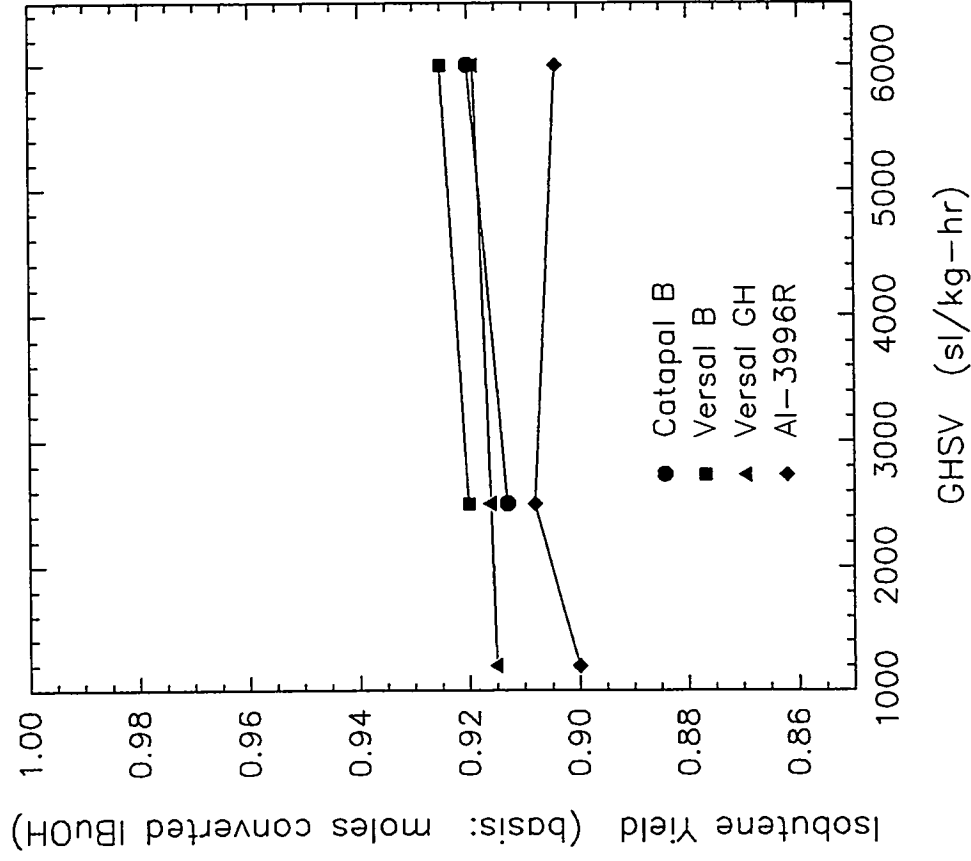
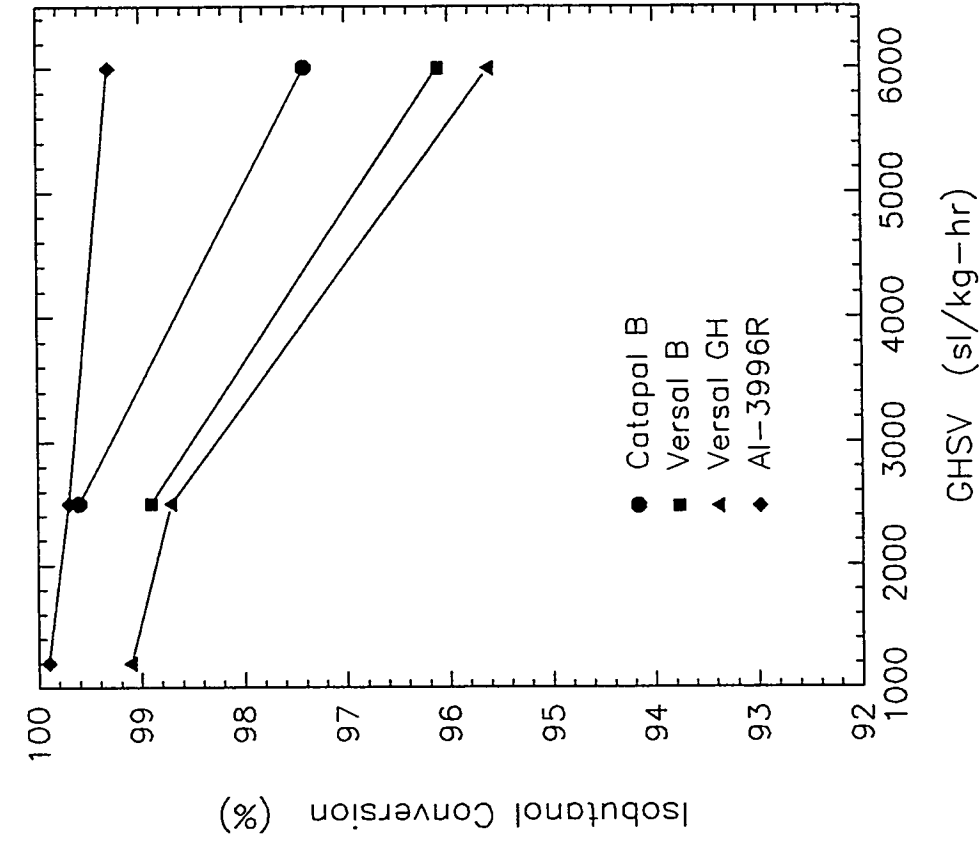


Figure 4.1.7: Effect of Feed Isobutanol Concentration on Isobutanol Conversion and Isobutene Yield

330 °C, 150 psig, GHSV=2500 sl/kg-hr, feed: Isobutanol in N2

Run No.: 11782-88, 11782-92

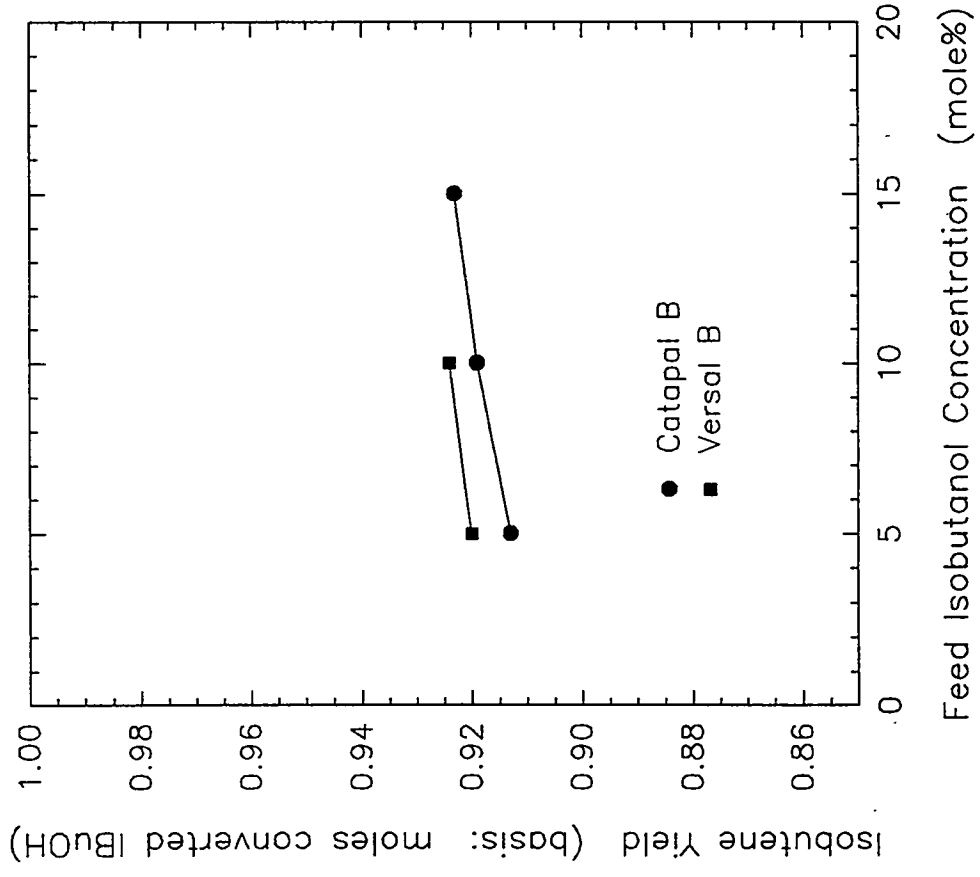
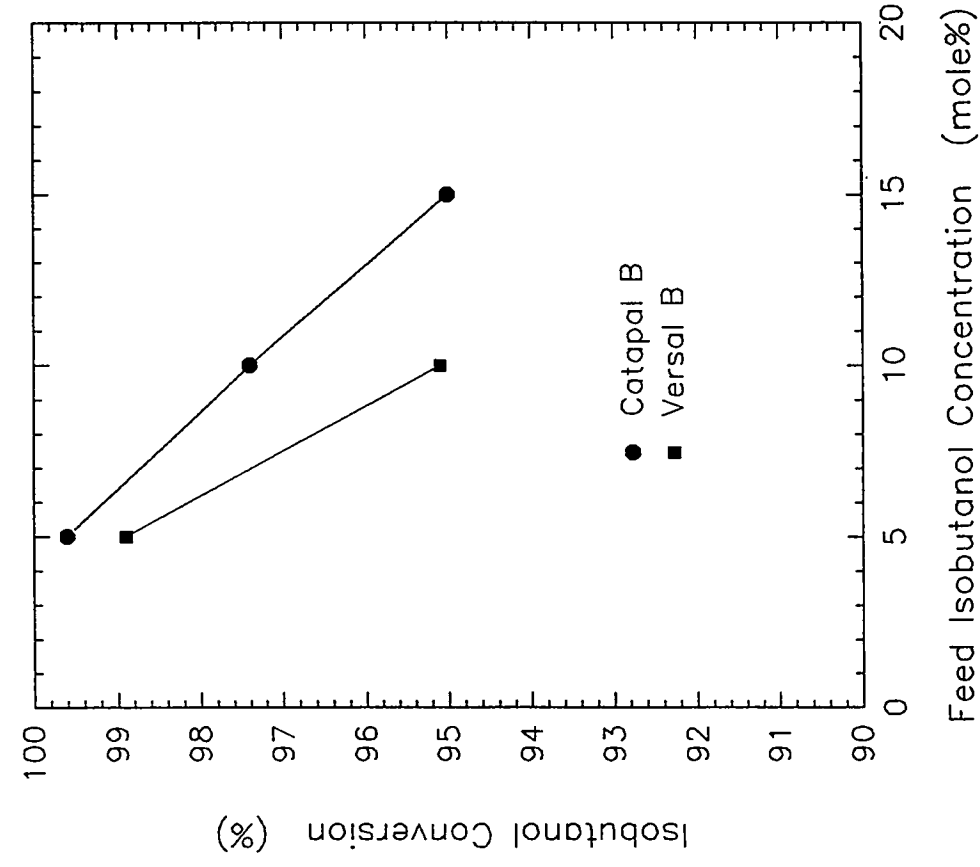


Figure 4.1.8: Effect of Isobutanol Conversion on Product Distribution

Catapal B

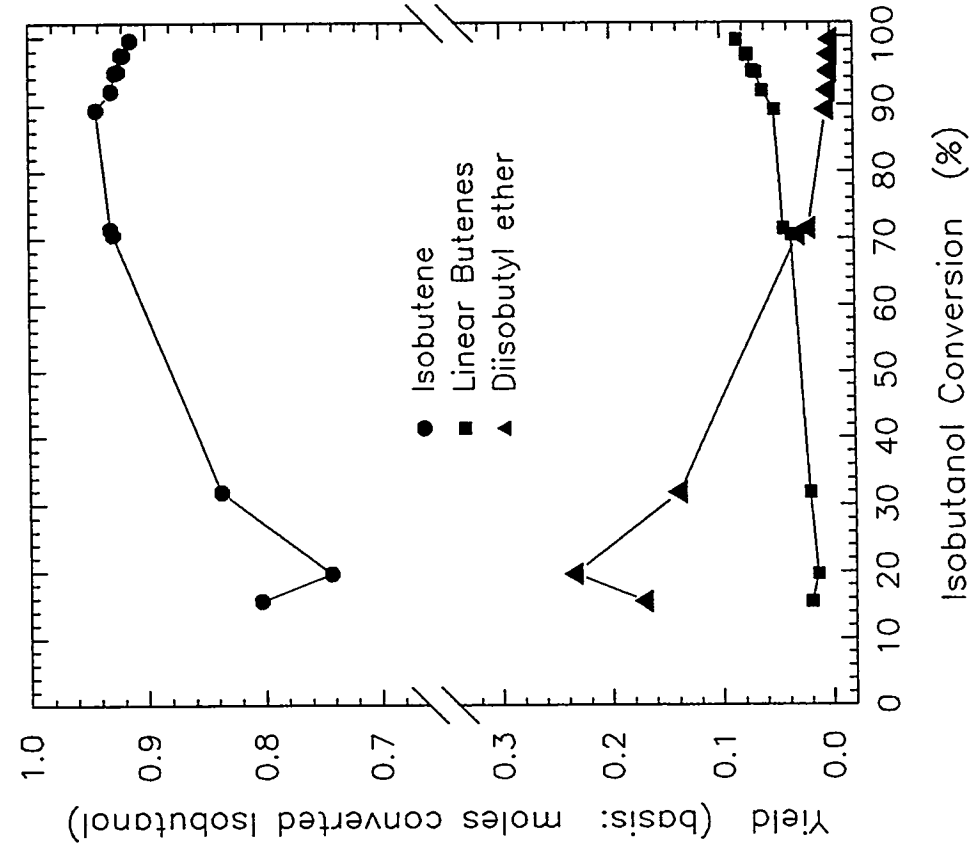
Run No.: 11782-88

250, 290, 330 °C

150, 500 750 psig

GHSV=2500, 6000 sl/kg-hr

5, 10, 15 mol% IBuOH in N₂



Versal B

Run No.: 11782-92

270, 330 °C

99, 150 psig

GHSV=2500, 6000 sl/kg-hr

5, 10, mol% IBuOH in N₂

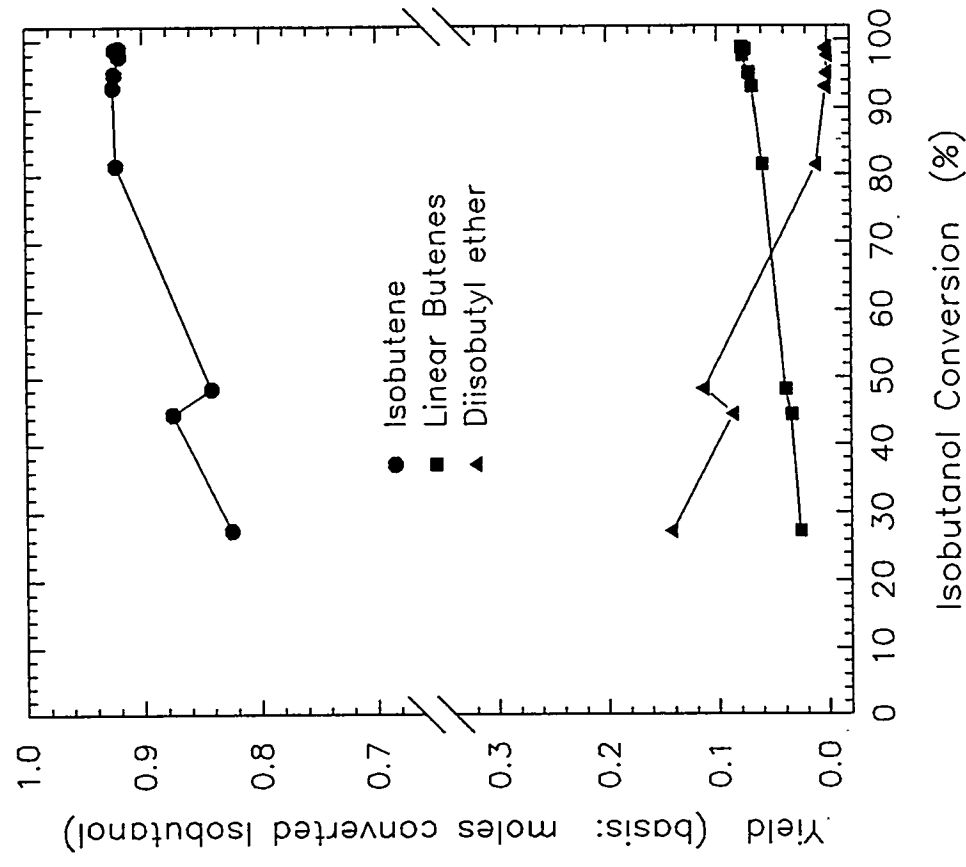


Figure 4.1.9: Effect of Isobutanol Conversion on Product Distribution

Versal GH

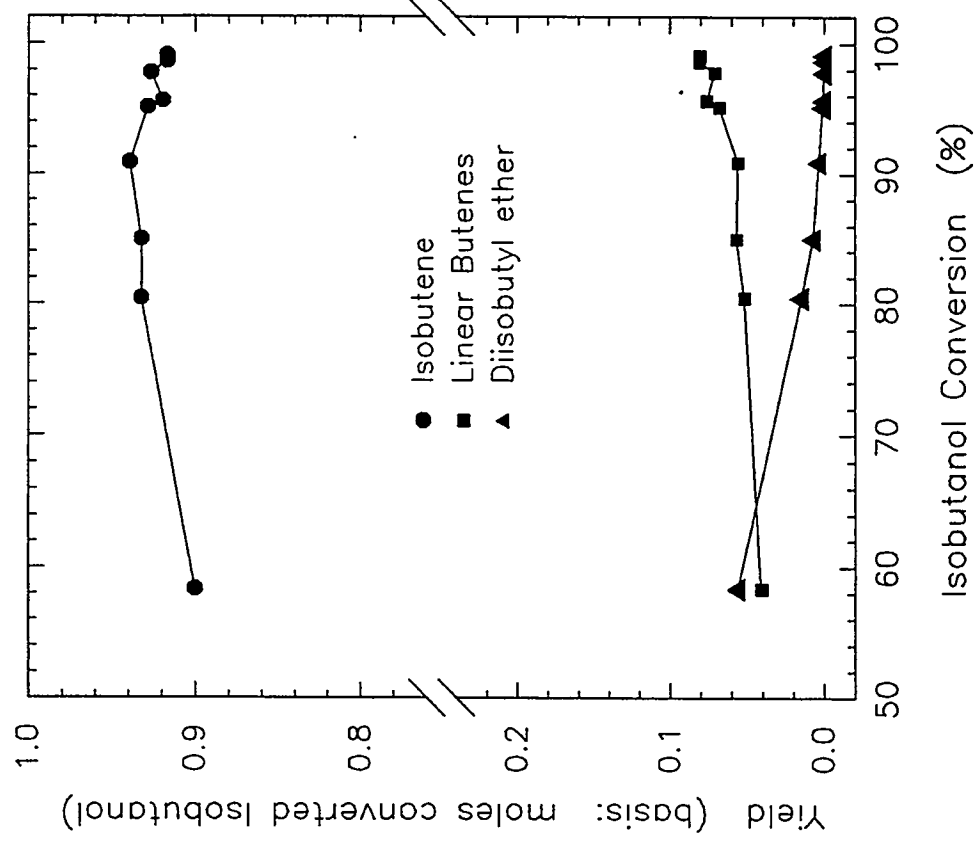
Run No.: 13033-12

290, 310, 330 °C

150 psig

GHSV=1200, 2500, 6000 sl/kg-hr

5 mol% IBuOH in N₂



Engelhard Al-3996R

Run No.: 13033-14

290, 310, 330 °C

150, 500 psig

GHSV=1200, 2500, 6000 sl/kg-hr

5 mol% IBuOH in N₂

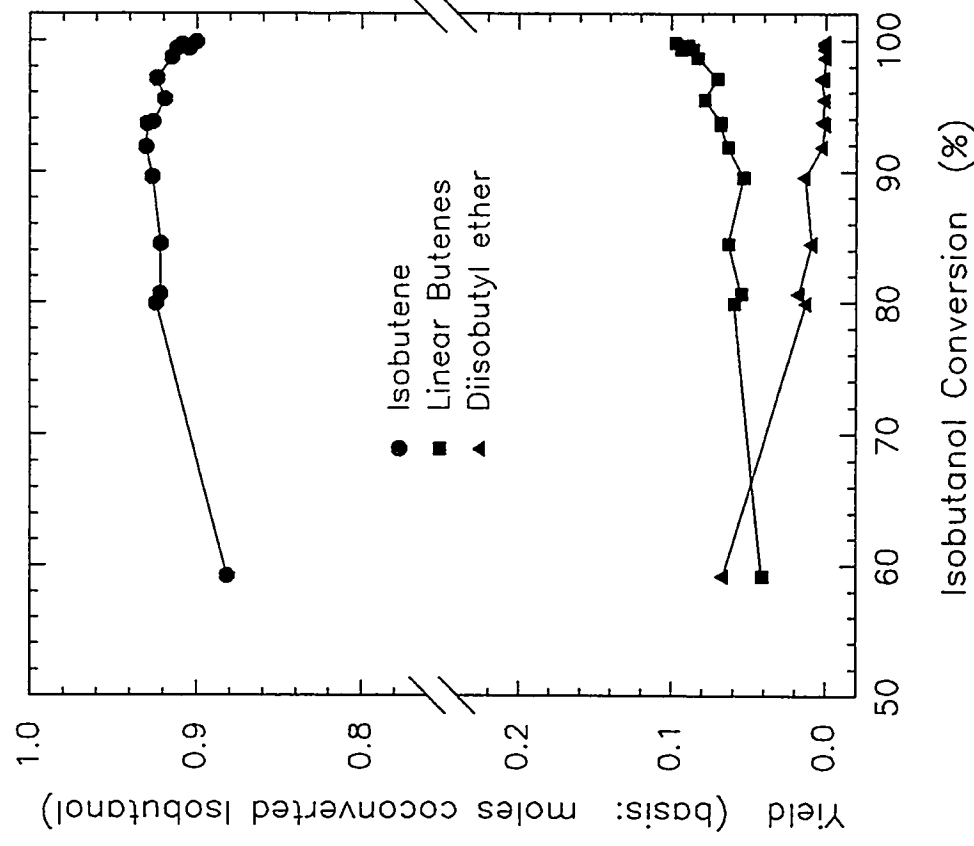


Figure 4.1.10: Yield of Isobutene Based on Moles of Isobutanol Feed as a Function of Reactor Temperature

150 psig, GHSV=2500 sl/kg-hr, 5 mol% Isobutanol in N₂

Run No.: 11782-88, 11782-92, 13033-9, 13033-12, 13033-14

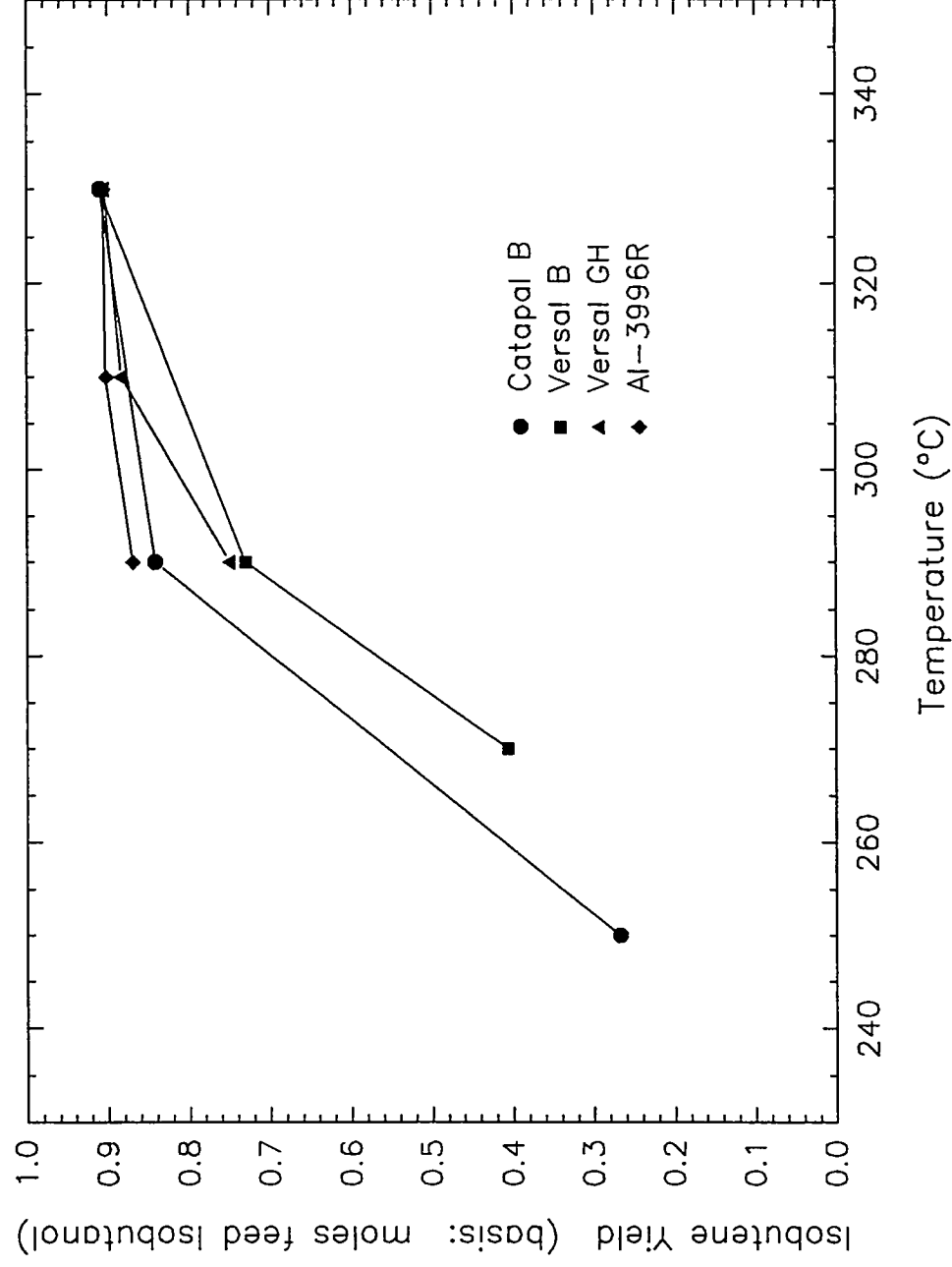


Figure 4.2.1: Effect of Gas Hourly Space Velocity on Isobutanol Conversion and Isobutene Yield for Potassium Doped Catapal B

330 °C, 150 psig, 5 mol% Isobutanol in N₂

Run No.: 11782-88, 11782-92, 13033-12, 13033-14

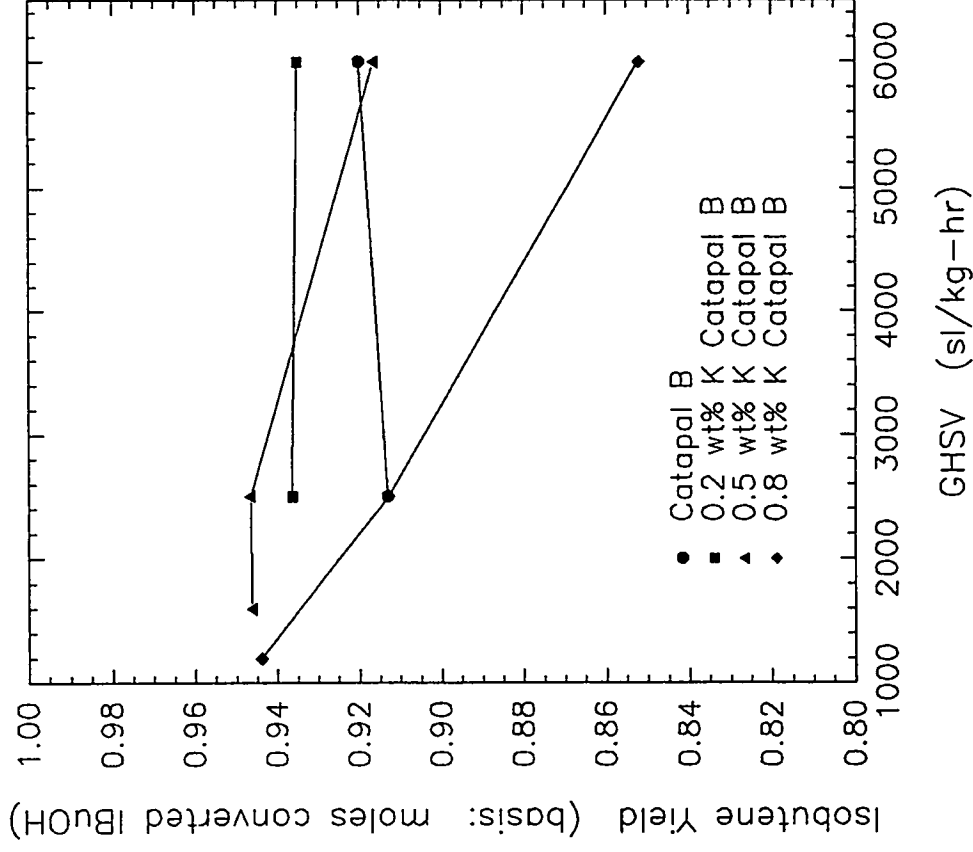
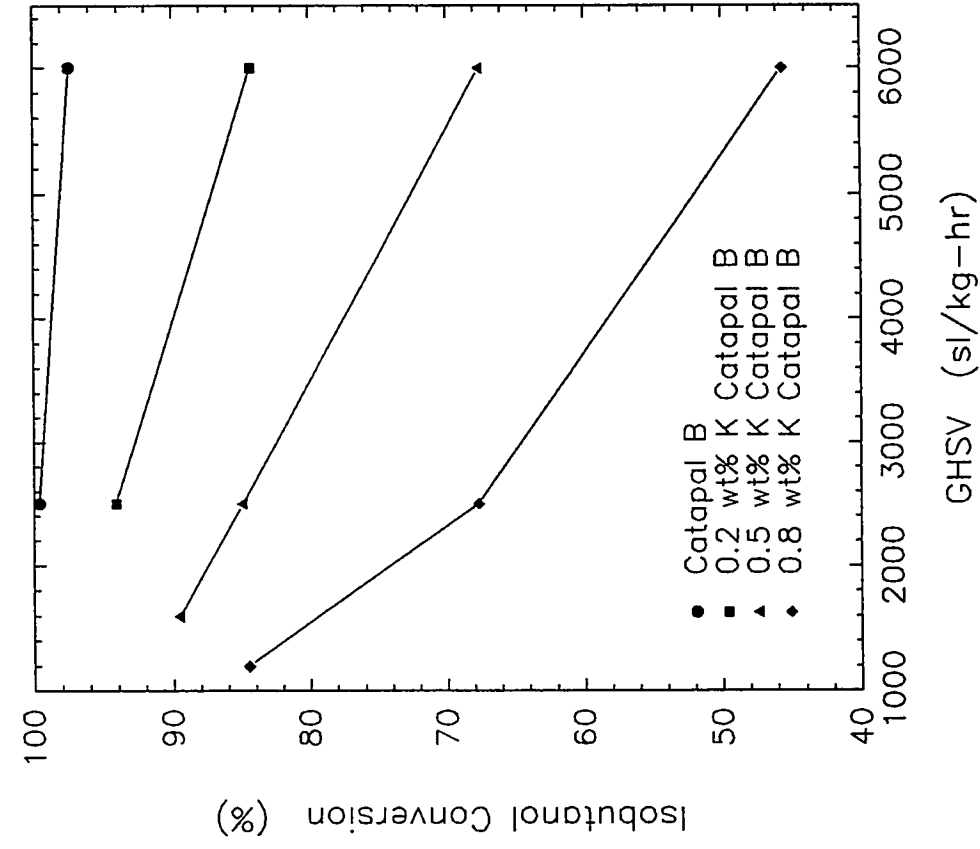


Figure 4.2.2: Effect of Gas Hourly Space Velocity on Isobutanol Conversion and Isobutene Yield for Potassium Doped Versal B

330 °C, 150 psig, 5 mol% Isobutanol in N₂

Run No.: 11782-92, 13033-9

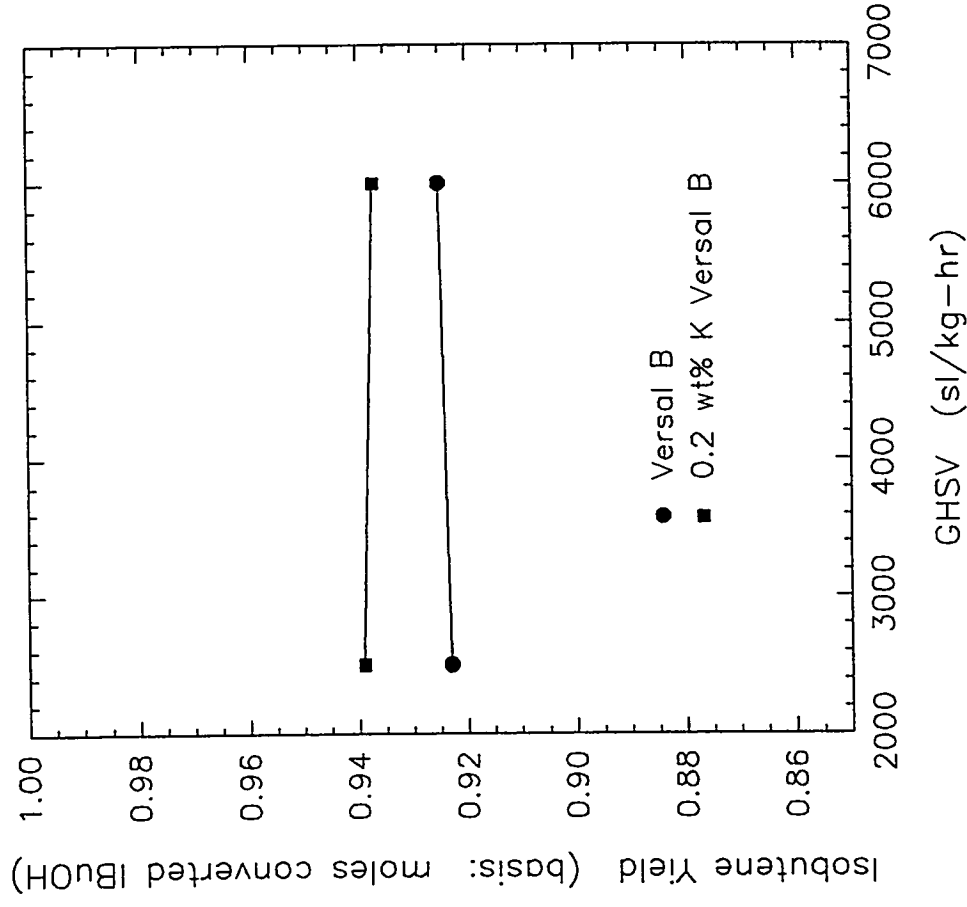
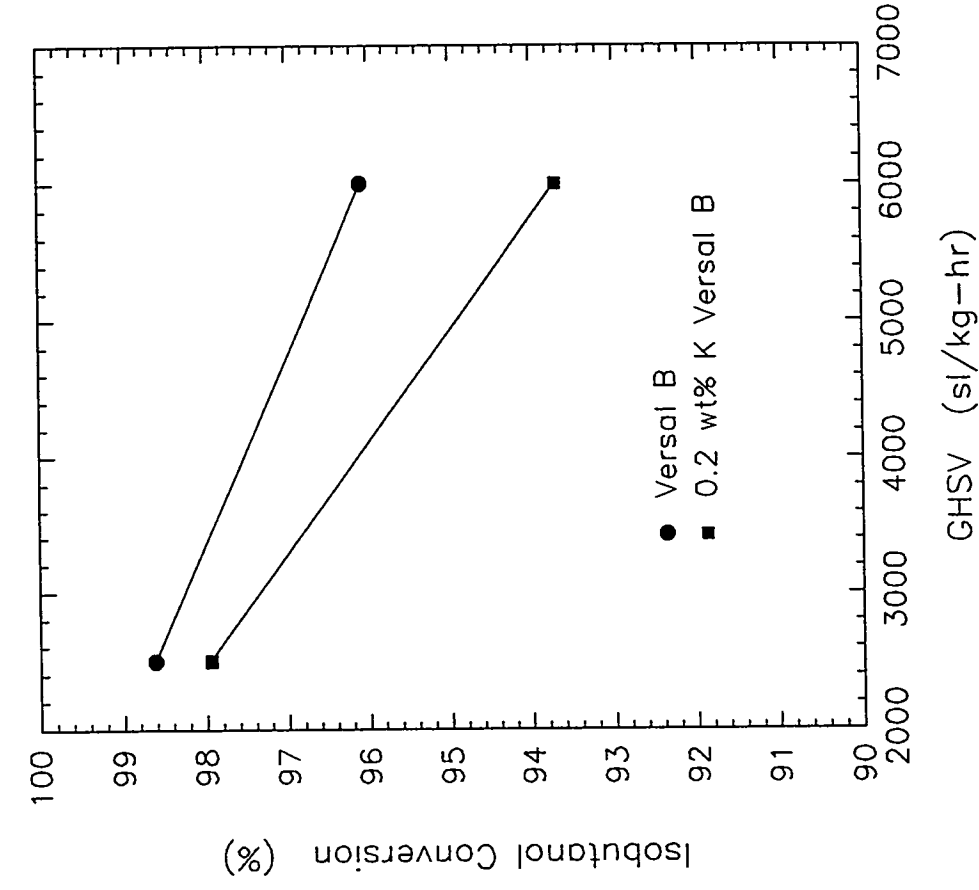


Figure 4.2.3: Effect of Potassium Dopant Weight on Isobutene Yield

330 °C, 150, 500, 750 psig, 5, 10 mol% Isobutanol in N2

GHSV=1200, 1600, 1600, 2500, 2500, 6000 sl/kg-hr

Run No.: 11782-88, 11782-98, 11782-01, 13033-1

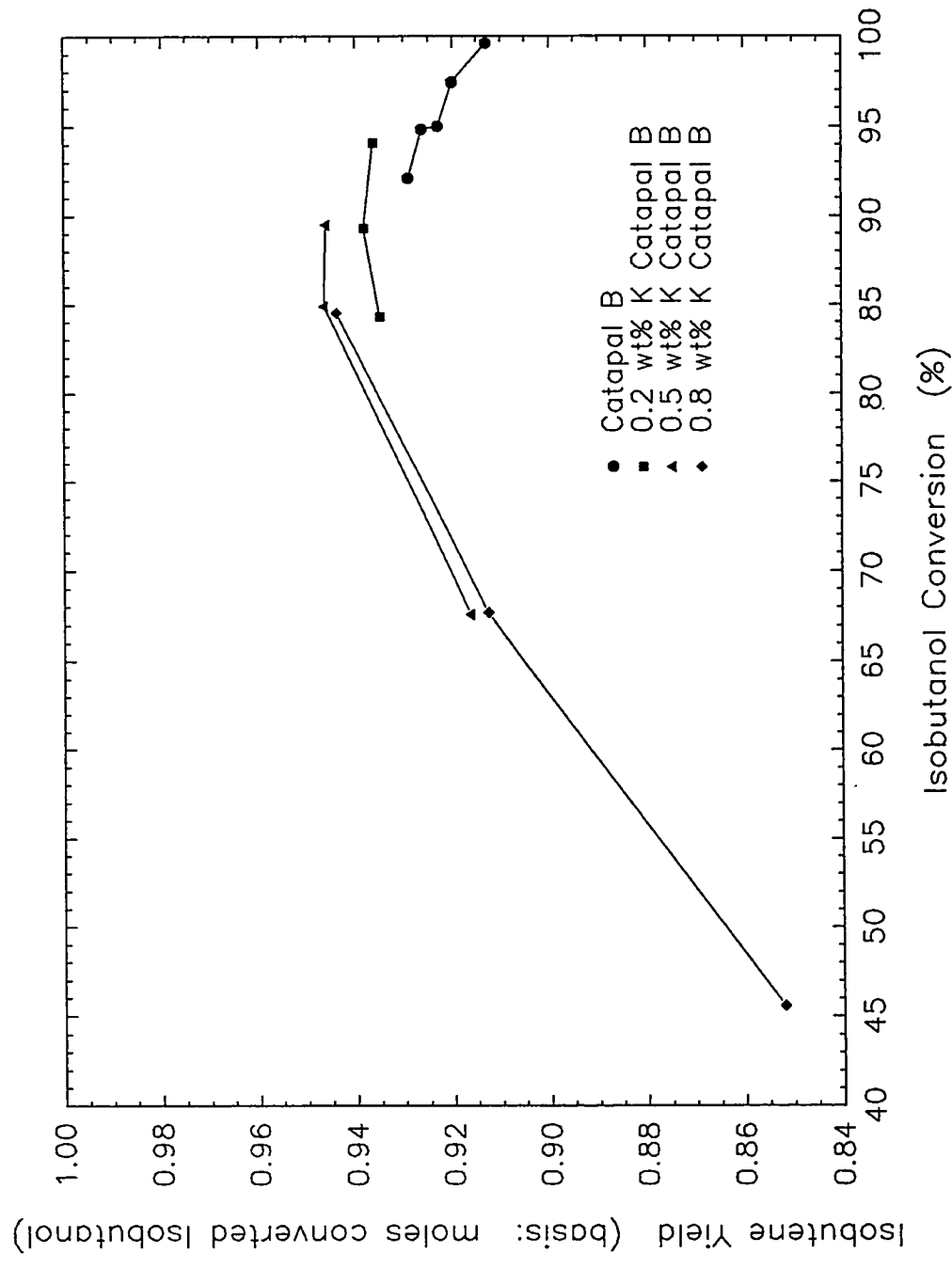


Figure 4.3.1

Calculated Rate vs. Measured Rate for Power Law Rate Expression

