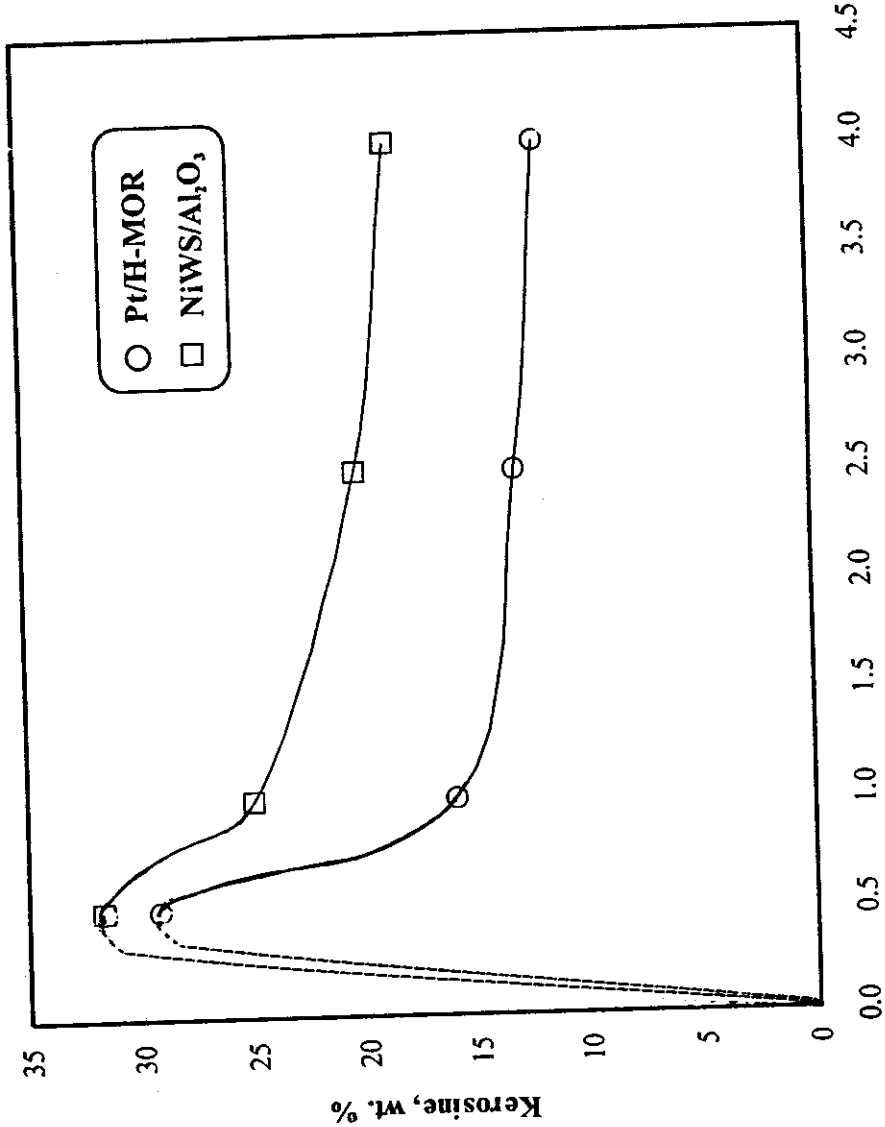

Figure 12. Kerosine yield as a function of reaction period at 450°C reaction temperature and 7.0 MPa operating pressure over the Pt/H-MOR and $NiWS/Al_2O_3$ catalysts.

3.5. Production of Gas Fraction

3.5.1. Effect of Reaction Temperature

Fig. 13 and Tables 1 and 2 show that the gas yield increases directly with increasing the temperature of the reaction using the two catalysts under study at 7.0MPa operating pressure and 1.0 h reaction time. The gaseous fraction produced on the Pt/H-MOR catalyst exceeds that produced on the $NiWS/Al_2O_3$ catalyst at all reaction temperatures used. At a reaction temperature of 425°C, the gas yield is 6.3 and 13.6% using the $NiWS/Al_2O_3$ and Pt/H-MOR catalysts, respectively, and increases continually as a function of reaction temperature to reach 32.0 and 33.8%, respectively, at a reaction temperature of 500°C. This can be attributed to the higher acid sites number and strength of the Pt/H-MOR catalyst **[130,131]** which accelerates hydrocracking of the heavier hydrocarbons of polyethylene into lighter hydrocarbons.

3.5.2. Effect of Operating Pressure

Fig.14 and Tables 3 and 4 show a steady increase of the gas yield with increasing the operating pressure using both catalysts under investigation at 450°C reaction temperature and 1.0 h reaction time. Throughout the pressure range investigated (3.0 – 9.0 MPa), the gaseous product increases from 16.8% at 3.0MPa to 19.8% at 9.0MPa using the $NiWS/Al_2O_3$ catalyst and from 19.6% at 3.0MPa to 21.8% at 9.0MPa on the Pt/H-MOR catalyst. This increase of the gaseous product may be attributed to the decreasing of coke deposition on the catalyst surface as a function of increasing operating pressure and then increasing the activity of the catalyst for hydrocracking of the polyethylene into gaseous molecules.

3.5.3. Effect of Reaction Period

Fig.15 and Tables 5 and 6 show that the gas fraction increases continually with increasing the reaction period using both catalysts under study in a more or less parallel fashion, at a reaction temperature of 450°C and a pressure of 7.0MPa. At a reaction period of 0.5h, the gaseous product amounts to 16.7 and 18.5% on the NiWS/Al_2O_3 and Pt/H-HOR catalysts, respectively and increase in a more or less paralled fashion with increasing reaction period to reach 25.4 and 27.8%, respectively, at 4.0 h.

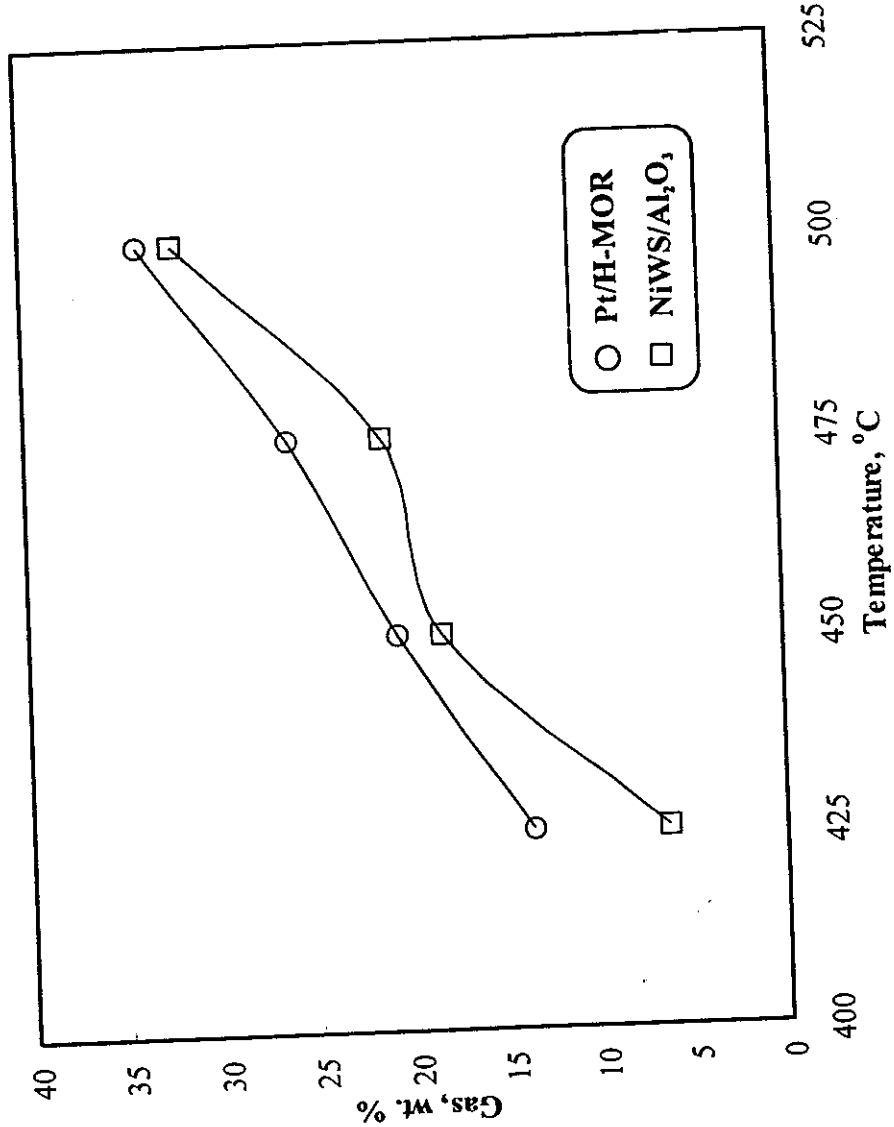

Figure 13. Gas yield as a function of reaction temperature at7.0 MPa operating pressure and 1.0 h reaction period over the Pt/H-MOR and $NiWS/Al_2O_3$ catalysts.

0

rature
ılysts.

25

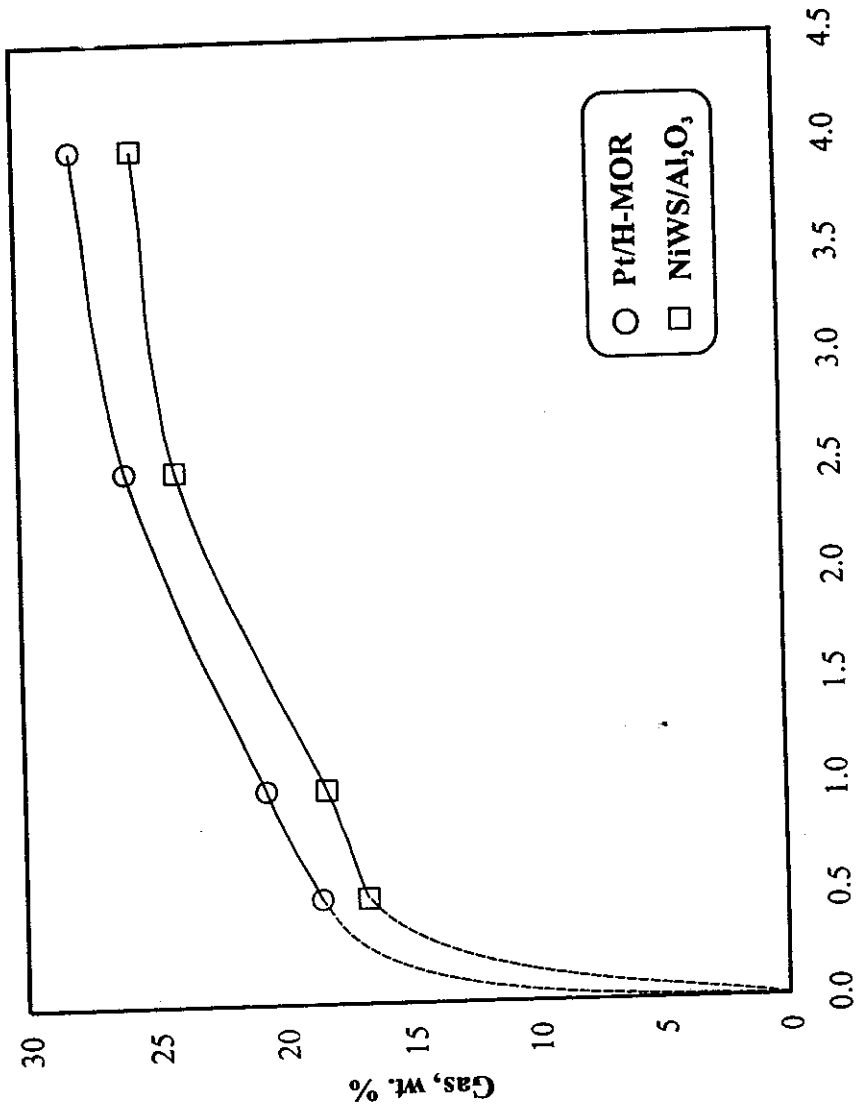

Figure 15. Gas yield as a function of reaction period at 450°C reaction temperature and 7.0 MPa operating pressure over the Pt/H-MOR and $NiWS/Al_2O_3$ catalysts.