

CHAPTER III

CONCLUSIONS AND RECOMMENDATIONS

MgAl₂O₄ spinel precursor could be prepared using OOPS process. The suitable sintering temperature needs to be used to transform spinel is 1200⁰C , over than this temperature the spinel began to fuse. This temperature is lower than the temperature needs to be used in other synthesis routes (1500⁰-1600⁰C) and the spinel product obtained are higher purity.

Sol-gel process is the process that helps the organization of molecule. MgAl₂O₄, which passes through sol-gel process, has better orientation. By varying pH of buffer solution, it was found that higher pH caused higher rates of hydrolysis and crosslink. The gelation time is decreased when increasing pH of buffer solution or temperature.

By fixing the concentration at 20% (w/v), buffer pH 8 gave very narrow pore size distribution and buffer pH 12 gave highest surface area and pore volume leading high moisture absorption. However, most sintered gels gave higher moisture absorption when compared with the precursor. The highest moisture absorption is as high as 0.31 g H₂O/g sample.