Chapter V

Conclusion.

1. The high-alumina compositions were studied for possible use as ball mill liners. The suitable composition was:

Calcined Al_2O_3	90.00 %
Ball clay (MC)	2.00 %
Bentonite	3.00 %
Talcum	4.25 %
Wallastonite	0.75 %

Whereas the particle size distribution should be 15 % by weight larger than 10 μm and 20 % by weight finer than 1 μm.

2. By extrusion forming method (with vacuum 700-760 mm./Hg) the 20 % H_2O high alumina composition was extruded in the brick shape and cut for a desired length.

3. The products after firing still had the same shape as that of before firing but with about 21 % shrinkage, 0.036 % water absorption and 88-90 % Al_2O_3 from EDS analysis which was near to the %Al_2O_3 content in the starting composition. The phases presented from XRD pattern confirmed that it was still α-Al_2O_3 phase with only a small amount of spinel phase.

4. The typical physical properties of the commercial liners which were produced by isostatic pressing method and those of the liners from this extrusion forming method were compared, the results were nearly the same.

Recommendation

From XRD pattern of the liner-product, there was some minor phase presented together with the major phase, α-Al_2O_3. It was spinel, $MgAl_2O_4$, which was the resultant from the reaction between MgO in talcum and the main component, Al_2O_3. This meant to the excess amount of talcum in this composition.

For improving, the new composition should be provided by decreasing the amount of talcum in the composition.