CHAPTER V

CONCLUSION

1. The average particle of raw clay was about 2.6 μm then high plasticity of red clay was though to come from these fine particles. Most of sand particles were coarse. Around 90 wt% of sand particles were in the range of 150-850 μm while grog particles included both coarse and fine particle.

2. SM commercial product had high water absorption and low bulk density because raw clay had low amount of alkali and alkaline earth oxides compared with Portugal and German commercial products. High water absorption and high volume of capillary pore of SM products suggested low frost resistance. High porosity of SM product came from ineffective pressing of the forming machine and shrinkage of the mixture components.

3. The coarse particles, sand and grog, disturbed the shrinkage of clay. The firing shrinkage increased at lower temperature by adding the flux material to increase the glassy phase.

4. Water absorption could not be decreased significantly only by changing amount and size of sand and grog. Water absorption decreased and bulk density increased significantly by adding flux materials. Soda-lime glass powder was a good flux material because its high percentage of alkali and alkaline earth oxides and low percentage of Fe_2O_3 did not significantly affect the fired color.

5. Fired color of specimen varied from orange to purple and dark-brown color, depending on the firing temperature. The orange color of hematite occurred at 950^{o}C and each flux showed not significant difference in fired color, except NaO.

6. S50G5 was an optimal formula without flux material and SGG was the same material as S50G5 but with flux material (5 wt% of glass powder). Water absorption of S50G5 was significantly lower than mixed clay 1 at every temperature and water absorption of SGG was lower than that of S50G5 at every temperature.

7. Capillary pore volume (< 2 μm) of SGG product decreased to lower than that of SM commercial products, but was still higher than those of Portugal and German commercial products. However, the capillary pore volume of SGG decreased to the similar level with that Portugal, when it was sintered at 950°C.

8. Particle size and the amount of sand affected the bending strength significantly. However the amount of sand was more effective than the particle size. The effect of amount and particle size of grog was not as significant as that of sand. Bending strength of specimen added flux component increased.

9. All of SGG pottery samples consisted of 2 pieces, small size (190 mm diameter x 170 mm height) and large size (320 mm diameter x 270 mm height) survived the test after 25 freeze-thaw cycles. They showed no sign of damage in the form of cracking and flaking.