

Chapter VI

Summary

The powder preparation is the most important step before the forming process. The rice husk ash consisted of agglomerated particles. They can be ground and classified to be appropriate for gel formation. This property is different from OX-50, which was used as reference material. The most favourable property of rice husk ash was its SiO_2 content (more than 99.8%) and its colloidal amorphous nature. So the sol-gel method was used. This cost of this method is much lower than the alkoxide method. The gel preparation of rice husk ash was different from OX-50. The OX-50 can be mixed with 1% ammonium fluoride, but rice husk ash has to be mixed with 5% boric acid, adjusted to pH by hydrochloric acid and ammonium hydroxide. The ratio of solid to solution was approximately 50:50. Gels were cast in non-absorbing molds. Gels were dried under humidity control condition to prevent cracking. The gel shrinking was approximately 30 percent. For sintering, the appropriate temperature of OX-50 was 1250°C , for 30-60 minutes. A transparent glass (no crystalline phase) and a bulk density approximately 2.20 g/cm^3 was obtained. For rice husk ash, the appropriate temperature was 1450°C for 5 - 10 minutes. For 1450°C , 5 - 10 minutes condition, the glass was not transparent (many pores); the density was slightly lower than 2.20 g/cm^3 . Except for the optical properties, this non-transparent glass has all the

outstanding features of silica glass, in specific its excellent high temperature and thermoshock resistance.



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