

A binder for extrusion molding ceramics.

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Methylcellulose(MC)is water soluble linear cellulose ether polymer and have unique properties of thermal gelation. Dissolved in water and heated, these polymers form gels which, on cooling revert to liquid.

Ceramic materials, unlike clay, are nonplastic when mixed with water and are thus impossible to form into any shape without the use of a binder. A binder for extrusion molding as methylcellulose is ordinary used.

A binder for ceramic extrusion molding examined about a relation between thermogel characteristic of MC and function of MC for the extrusion molding.

(1) Lubrication and shape retention.

A binder-hydroxypropylcellulose(HPC) that does not have thermal gelation ability and MC were used to make a ceramic/binder/water/etc. mixed composition and measured the mixed composition. (fig.1) Compared to same extrusion molding load, MC mixed composition is harder than other composition. It means that MC mixed composition is difficult to deviate molding shape after extrusion molding immediately.

A binder is used as high concentration solution in mixed composition for extrusion molding. Viscoelasticity of high binder concentration solution was compared. (fig.2) It is conceivable that high viscoelasticity of MC solution is getting involved in thermogel possibility of MC and getting involved in shape retention.

(2) A crack occurrence prevention function in drying.

A binder(HPC and HEC)that does not have thermal gelation ability and MC were used to make same content ceramic/binder/water/etc. mixed composition for thin sheet extrusion molding. A volume of cracking that enters to a sheet by drying contraction was compared. (fig.3) As for the sheet that gelation of the binder can greatly reduce or eliminate crack occurrence.

