

题 目 基于VTK的三维可视化平台开发

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

计算机科学与工程院（系）计算机科学与技术专业

学 号 09015322

学生姓名 贺建安

指导教师 唐慧

起止日期 2019年2月 至 2019年5月

设计地点 东南大学九龙湖校区

摘 要

直接体绘制能够立体且直观地展示出目标的空间体细节，是科学可视化重要的研究与应用领域。作为直接体绘制的核心，传递函数的设计决定着最终的绘制效果。

关键词：

Abstract

In this thesis, the rheological behavior of semi-solid ZA12 alloy was investigated using a specially designed high temperature Couette rheometer.

The evolution of shear stress with time and the hysteresis loops of semi-solid ZA12 alloy were measured and analyzed. The results show that semi-solid ZA12 alloy possesses the thixotropic property, which varies with solid fraction and shear rate. In addition, the semi-solid ZA12 alloy slurry exhibits different rheological behaviors under steady state and transient state conditions. In case of steady state, the apparent viscosity of semi-solid ZA12 alloy decreases with the increase of shear rate, showing the pseudo-plastic rheological behavior. However, under the transient state condition, it presents the dilatant rheological behavior, i.e. the apparent viscosity increases as shear rate increases.

Finally, based on the transient state experimental results and rheology theory, a dynamic rheological model of semi-solid ZA12 alloy was developed, which could be applicable to practical semi-solid processes.

KEY WORDS: semi-solid, ZA12 alloy, thixotropic behavior, rheological behavior, apparent viscosity, rheological model