$f_m$ corresponding to the relatively highest surface area magnification under certain etch condition. $f_m$ was also temperature dependent, it moves toward higher value with increase of temperature. The preferable frequency and temperature were 20Hz and 35℃ respectively. Based on the breakdown potential obtained from the oscillogram, the weight and the morphology of etch film, it may be concluded that with the frequency below $f_m$ the etch film formed was thin and it was easy to be broken through to produce a higher density of pits, which would be merged with each other ultimately, leading to a loose morphology; with the frequency higher than $f_m$ the etch film was too thick to be broken through, the etch morphology exhibited only a few large pits. Only at $f_m$ the thickness of the etch film was suitable to produce a moderate density of pits, and at last a deep layer of roughened metal was formed, giving the maximum surface area magnification. The importance of the initial aluminum surface condition in A.C. etching was also discussed.

**研究生论文摘要**

# 载流床粉煤气化器计算机模拟研究

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在前人大量工作的基础上，初步建成了载流床煤气化反应器模拟的计算机程序系统——CPSCG (computer program System for coal Gasification)。程序系统由四部分组成；1. 气化器模拟计算程序；2. 内壁温度及壁中温度场分布计算程序；3. 气化模型参数估算程序及 4. 模拟法最优化程序。其中模拟程序为系统的核心、壁温计算程序应用有限单元法。与模拟程序一道，对内壁温度进行了准确地模拟，从而使散热损失的计算更为可靠。参数估算程序的建立可以根据一些实验数据来估计模拟型中的各个参数，它是整个反应器模型准确可靠的工具。模拟法最优化过程程序可以根据模拟计算，为我们提供最优操作的参考。

在VAX-11/780计算机上，应用CPSCG 对反应器操作条件、几何尺寸等参数的灵敏性进行了模拟计算，并进行了模拟参数估算及优化。部分计算结果与实验数据作了比较，得到满意的结果。CPSCG的建立为我国煤气化过程的CAR及CAD*提供了一个强有力的应用软件。

* CAR和CAD分别为Computer-aided Research 和 Computer-aided Design

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