新能源行业浆料分散研磨应用报告

——制造锂电池所需浆料

Field 行业: lithium batteries 锂电池

Product 产品: battery slurry 电池浆料

(components: Binder/carbon/graphite/other additives)
(产品成分：粘合剂/碳/石墨/其他添加剂)

Characteristics 特性:
medium viscosity 中粘度
good flowability 流动性好
very thixotropic 触变性高

Task 工作任务:

The customer wants a homogeneous product with a narrow particle distribution. The product shouldn't get in touch with air because it is likely to react with oxygen. The process time is not an issue, the quality is more important. The initial particle size was fine enough for the purpose, a comminution was possible but not necessary.

客户要求分散后的产品匀质并且粒子细度分布集中。但这种产品很容易与氧气发生化学反应，故不能接触空气。客户更关注成品的质量而不是分散所用的时间。原始粒径已足够小足以达到目的，可以进行粉碎但没有必要。

Motivation 目的:

A uniform particle size is required to produce an evenly covering layer and to guarantee a regularly electric conductivity inside of the finished product.

需要产品的颗粒粒径一致，以产生均匀的覆盖层，保证成品内部有规律的电导率。

Solution 解决措施:

Preparation 准备工作:

The product was filled in a 3l container and was temperature controlled during the dispersing process (70°C). The product basic mass was stirred with a 60 mm dissolver disc by 850 rpm for 2,5 h (= 2,6 m/s). This was a dissolving process to bind plastic powder in the product. At this point the paricle size is >100 µm.

将产品装进3L的容器里并在分散过程中实现恒温控制(70°C)。用60mm的分散盘对产品基料以每分钟850转的转速搅拌2.5小时(相当于线速度2.6米/秒)。这个分散过程是为了将塑料粉末粘合在产品上。此时的粒径大小大于100µm。

Solution 解决措施:

Trial 实验过程:

The finished product basic got decanted into a 2l container with different additions. After 5 min of stirring with 700 rpm (50 mm disc = 1,8 m/s), the actual dispersing process starts under vacuum (50 mbar absolute). The product got processed over 20 min by 5720 rpm (= 15 m/s).

将成品基料倒进2L的容器中并加入不同的添加剂。经过5分钟的700 rpm搅拌(50 mm盘= 1.8 m/s)后，在绝对真空(50 mbar)情况下进行高速分散。每分钟转速为5720转(相当于线速度为15米/秒)，分散该产品超过20分钟。

Post preparation 后期制备:

The finished product got cooled down by water to 30°C. Afterwards it is evacuated and the paste got stirred for another 10 min by 1750 rpm (= 4,5 m/s).

最终制品通过水浴冷却到 30°C，浆料继续在真空状态下分散，并以1750转/分钟(相当于线速度为4.5米/秒)的转速搅拌10分钟。

Equipment 使用设备: 德国VMA公司Dispermat真空搅拌分散机

Experimental site 实验地点: 德国VMA公司专用实验室

Test method 检测方法: Particle size with Grindometer 用刮板细度仪检测粒径大小

Result 最终结果: < 20 µm

Total Time 总时长: approx. 3h 大约3小时

Feature 突出特点:

1、德国VMA公司巧妙设计了可在同一台机器上实现对产品进行搅拌、分散和研磨等工序。
2、使用VMA Dispermat真空高速分散机能达到理想的分散效果，且提供绝对真空状态，产品不易被氧化。
3、能实现有效的温度控制，达到客户要求
4、德国VMA Dispermat 分散机还有多种适应性强的设备系统，并且有容易清洗、操作简单等优势。