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中文概要

题　目：熔盐沿储罐缝隙泄漏的迁移与凝固实验研究

目　的：高温熔盐泄漏后在多孔材料中的渗流和凝固问题对于泄漏事故的处理具有重要的指导意义，但目前仅有少量关于熔盐在冷态沙子或土壤中渗流的研究。本文通过实验研究了高温熔盐通过储罐缝隙泄漏流入热稳态地基材料的渗流特性。实验测量了不同条件下的熔盐渗流范围，包括缝隙尺寸、熔盐运行温度和熔盐泄漏量。该研究可以指导高温储罐的环境污染处理和熔盐储罐的泄漏检测等工作。

创新点：1. 搭建了模拟储罐熔盐泄漏的热态试验装置； 2. 研究了缝隙长度和宽度对熔盐泄漏和迁移的影响。

方　法：1. 通过自行搭建的熔盐泄漏热态试验装置，研究了熔盐运行温度、缝隙长度、缝隙宽度、泄漏熔盐质量对熔盐在地基中的迁移和凝固的影响； 2. 通过理论分析，解释了泄漏事故后地基材料的热稳定温度随泄漏熔盐质量的增加而升高的具体原因。

结　论：1. 当缝隙宽度范围为3–10 mm和缝隙长度为5–30 mm 时，熔盐渗流深度和平均渗流宽度均变化不大，但熔盐在地基材料上部的渗流宽度会随缝隙尺寸的增大而明显增大；2. 当熔盐通过缝隙泄漏在地基材料中时，储罐的运行温度是影响熔盐渗流深度的最重要因素；3. 泄漏熔盐质量在一定范围内的增加对熔盐渗流深度影响不大，渗流宽度会随熔盐质量的增大而增大, 并且泄漏事故后地基材料的热稳定温度随泄漏熔盐质量的增加而升高。

关键词：熔盐；泄漏；迁移；缝隙；地基材料