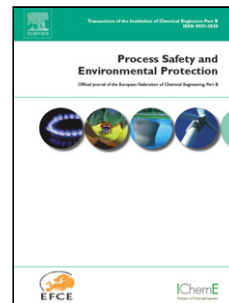


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Long-term dust generation from silicon carbide powders

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Abstract

Most dustiness studies do not measure dust release over long durations, nor do they characterize the effect of dust release on bulk powders. In this study, we tested the dustiness of two different samples of silicon carbide (SiC) powders (referred to as F220 and F320) over six hours using a vortex shaker. Additionally, we characterized the bulk sample for change in shape and size distribution due to the testing. Both powders release respirable fractions of dust particles but differ in their dust generation behavior. The numbers of released respirable particles for powder F220 are more than two times higher than those of powder F320.

The dust generation mechanism might include the release of aerosols due to the attrition of particles owing to inter-particle and particle-wall impaction. This study emphasizes the need for long duration dustiness tests for hard materials like SiC and characterization for change in bulk material properties due to dust generation and release. Furthermore, the results can aid in selecting the bulk material for long-term applications based on dustiness.

Keywords: Dustiness, Silicon carbide particles, Vortex shaker, Attrition, Dust generation mechanism.

1. Introduction

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