

## Particle statistics

In a famous series of calculations published in Klug and Alexander it was calculated that IF a powder was crushed to 1 micron in size, the amount of powder in a large cavity mount, would be barely sufficient to achieve 1% reproducibility in intensity.

This calculation assumed a single point detector having a small detection volume which in this example, at 1 micron, would detect 38,000 out of 38 billion particles in the sampling volume. Notice the dramatic increase in available particles as the size is decreased.

## How many particles do you need for 1% accuracy in intensity

	<u>40μm</u>	<u>10μm</u>	<u>1μm</u>
# diffraction particles	12	760	38000

To achieve 1% accuracy

$$\sigma = \sqrt{n}/n$$

$$\text{Std. err.} = 2.3 \sigma < 1\%$$

$$n > 52,900 \leftarrow$$



# Small Particle Statistics An Account Of

**Liying Dong**



## **Small Particle Statistics An Account Of:**

**Small Particle Statistics** Gustav Herdan, Mervyn Leslie Smith, 1953      **Small Particle Statistics** Gustav Herdan, 1960

**Catalog of Books and Reports in the Bureau of Mines Technical Library, Pittsburgh, Pa** United States. Bureau of Mines. Technical Library, Pittsburgh, 1968      *Small Particle Statistics* G. Herdan, 1960      Nuclear Science Abstracts, 1973

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examined The latter part of the book deals with separation processes such as distillation and gas absorption which illustrate applications of the fundamental principles of mass transfer introduced in Chemical Engineering Volume 1 In conclusion several techniques of growing importance adsorption ion exchange chromatographic and membrane separations and process intensification are described A logical progression of chemical engineering concepts volume 2 builds on fundamental principles contained in Chemical Engineering volume 1 and these volumes are fully cross referenced Reflects the growth in complexity and stature of chemical engineering over the last few years Supported with further reading at the end of each chapter and graded problems at the end of the book **EPA-600/4** ,1979-06

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