

in some earlier work (1) a method of structure analysis was put forward using the degree of bonding as the principal factor. This paper takes the same analysis further and discusses the role of particle size, sintering activity. It finally discusses the structure development during sintering and the practical implications.

A CRITICAL ASSESSMENT OF STRENGTH DEVELOPMENT IN POROUS MATERIALS.

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(A) ABSTRACT

The development of strength in porous materials is difficult to quantify for analysis, particularly over the very high porosity ranges, because of the large spatial arrangement of particles and the low order of bonding.

By considering the order of the bonding and then calculating the number of bonds involved in the sintering process i.e. 'BOND INDEX', it becomes possible to calculate the comparative bond strength. This then allows the evaluation of structures made by various routes and powders and ultimately to arrive at the best procedure.

The sintering activity of the structures can also be included from consideration of particle size or subparticle size in the more complex particles and thus make interpretations with regard to whether the number of the bonds present or the sintering activity has the greatest effect on the strength development.

(B) INTRODUCTION

Porous structures with porosities above 50% are usually produced by loose sintering techniques. The highest porosities between 70 and 90% require the use of very open structured filamentary powders. The strength of materials appear to be quite low, but because of the very open structure away from close packing it is difficult to assess