Combinatorial process for Bulk Metallic Glasses

OCR Number: OCR 6186

Rapid Development of BMG Alloys with High Formability

Combinatorial Sputtering

Al
10-30 %

Cu
30-60 %

Zr
30-55 %

High-Throughput Characterization

\[ F = \frac{1}{M} \int \frac{1}{\eta(T)} dT \]

\[ F \propto \frac{h}{S} \]

Compositional Library
Gas Releasing Agents
(GrAS) (GrAS)
Si

Steel
High-Throughput Characterization of Formability

\[ F \propto \frac{h}{S} \]

A.

P1

Si Mold

P2

BMG

B.

~3000 compositions

C.

Si Mold

MG Film

P1

P2

Yale 5.0kV 5.2mm x120 SE(M)

Yale 5.0kV 0.1mm x5 SE(M)
Mg-Cu-Y

Best formability composition here: $\text{Mg}_{69}\text{Cu}_{21}\text{Y}_{10}$

Best formability composition reported: $\text{Mg}_{65}\text{Cu}_{25}\text{Y}_{10}$

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