DEFECT CHARACTERIZATION OF SILICON DENDRITIC WEB RIBBONS

JET PROPULSION LABORATORY

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Due to Dislocations
Possible Movement of Three Major Slip Planes Under Stress

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ADVANCED SILICON SHEET

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INTERCEPTS OF (111) AND (111)
TWIN BOUNDARIES WITH THE
RIBBON SURFACE

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INTERCEPTS OF (111) AND (111)
TWIN BOUNDARIES WITH
THE TWIN PLANE

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ETCH PIT LINES DUE TO SLIP
DISLOCATIONS [101]

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THE TWIN PLANE IN THE CENTER OF
THE RIBBON PARALLEL
TO THE SURFACE

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100 microns
TOTAL STRESS ON THE FIRST DISLOCATION DUE TO THE PRESENCE OF NEIGHBORING DISLOCATIONS ALIGNING ALONG x DIRECTION

\[ \sigma_{xy}^{\text{tot}} = \frac{\mu b}{2\pi(1-\nu)} \sum \frac{1}{x} \]

EXPERIMENTAL DATA

\[ \sigma_{xy}^{\text{tot}} \text{ (AT THE PILEUP)} = 1.07 \times 10^8 \text{ dynes/cm}^2 (1.55 \times 10^3 \text{ PSI}) \]

USING \( \nu = 20 \text{ PSI} \)

\[ \mu = \frac{\nu}{2(1-\nu)} = 9.57 \times 10^{11} \text{ dynes/cm}^2 \]
ADVANCED SILICON SHEET

![Graph showing the relationship between reciprocal of distance between two nearest etch pits and distance from ribbon edge (mm).]
Cross-Section EBIC in As-Grown Web Ribbons (taken at room temperature)

Temperature Dependence of EBIC in Diffused Silicon Web Ribbon
SEM Picture of Etched Cross-Section of Silicon Web Ribbon

Original page is of poor quality.
Effect of Diffusion

DIFFUSED

TWIN PLANE

As-GROWN

EBIC

0

X

535