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A novel approach to fabricate high aspect ratio micro-rod using ultrasonic vibration-assisted centreless grinding

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**Highlights**

- Detailed analysis of micro-cylindrical workpiece rounding mechanisms
- A novel approach to control micro-rod rotational motion in microscale
- A new method to fabricate high aspect ratio micro-rod for precision manufacturing
- A reliable mechanics model for understanding the material removal process
- Identified the motion control ability of elliptic vibration through contact friction

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