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## Buffered chemical polishing process of 3.9 GHz cavities for SHINE

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The linear acceleration part of the SHINE project consists of two 3rd harmonic cryogenic modules which are operating at 3.9 GHz. Each of the cryomodules consists of eight 3.9 GHz 9-cell superconducting cavities. The SHINE specifications of the 3.9 GHz cavities are  $Q_0 > 2.0 \times 10^9 @ 13.1$  MV/m and maximum accelerating gradient  $> 15$  MV/m. The 3.9 GHz cavities were treated with buffered chemical polishing (BCP) baseline combined with 2-step low-temperature baking surface treatment process to meet the specifications. In order to achieve the required performance, the BCP process had been optimized at the SHINE Wuxi surface treatment platform, especially the acid ratio. Vertical tests of all 3.9 GHz bare cavities treated with the optimized BCP process showed  $Q_0$  up to  $3.0 \times 10^9 @ 13.1$  MV/m and maximum accelerating gradient over 20 MV/m. The optimized BCP process applied to the 3.9 GHz cavities and related vertical test results were presented in this paper.

### Footnotes

### Funding Agency

### Paper preparation format

### Region represented

Asia

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