

Abstract Submitted
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Characterization of NiSi nanowires as field emitters and limitations of Fowler-Nordheim model at the nanoscale¹ AMINA B. BELKADI, University of Colorado - Boulder, E. GALE, Khalifa University - KUSTAR, A.F. ISAKOVIC, Khalifa University - KUSTAR, KSRC — Nanoscale field emitters are of technological interest because of the anticipated faster turn-on time, better sustainability and compactness. This report focuses on NiSi nanowires as field emitters for two reasons: (a) possible enhancement of field emission in nanoscale field emitters over bulk, and (b) achieving the same field emission properties as in bulk, but at a lower energy cost. To this end, we have grown, fabricated and characterized NiSi nanowires as field emitters. Depending on the geometry of the NiSi nanowires (aspect ratio, shape etc.), the relevant major field emission parameters, such as (1) the turn-on field, (2) the work function, and (3) the field enhancement factor, can be comparable or even superior to other recently explored nanoscale field emitters, such as CdS and ZnO. We also report on a comparative performance of various nanoscale field emitters and on the difficulties in the performance comparison in the light of relatively poor applicability of the standard Folwer-Nordheim model for field emission analysis for the case of the nanoscale field emitters. Proposed modifications are discussed.

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