IR spectroscopy with pyrolytic carbon string resonator as a tool for particle detection

Nguyen, Quang Long; Larsen, Peter Emil; Schmid, Silvan; Boisen, Anja; Keller, Stephan Sylvest

Publication date:
2017

Document Version
Publisher's PDF, also known as Version of record

Link back to DTU Orbit

Citation (APA):
IR spectroscopy with pyrolytic carbon string resonator as a tool for particle detection

Long Nguyen Quang *, Peter Emil Larsen *, Silvan Schmid a,b, Anja Boisen a and Stephan Sylvester Keller a

* Department of Micro- and Nanotechnology, Technical University of Denmark, 2800 Kongens Lyngby, Denmark;
 b Institute of Sensor and Actuator Systems, Vienna University of Technology, Gusshausstraβe 27-29, A-1040 Vienna, Austria

INTRODUCTION

MEMS String Resonator

Pyrolytic Carbon

- Isotropic properties
- Conductive material
- Controlable properties

Pyrolytic Carbon String Resonator

Infrared Spectroscopy

RESULTS AND DISCUSSION

SEM image of pyrolytic carbon string

Length 500µm Thickness 700nm

Resonance Frequency

Quality Factor

IR Absorption

Allan Deviation

CONCLUSION

We demonstrate the fabrication of the pyrolytic carbon string resonators with optimized process. The carbon string resonators are then characterized by interferometry to obtain the resonance frequency and Q factor. A resonant photothermal IR absorption measurement shows the absorption spectrum of the materials. The results show the potential of the pyrolytic carbon string resonators as a tool for particle detection.