US 20220407487A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2022/0407487 A1**

LIU (43) **Pub. Date: Dec. 22, 2022**

(54) **METHOD FOR FORMING BULK ACOUSTIC WAVE RESONANCE DEVICE**

(71) Applicant: **CHANGZHOU CHEMSEMI CO., LTD.**, Changzhou (CN)

(72) Inventor: **Yuhao LIU**, Shanghai (CN)

(21) Appl. No.: **17/640,338**

(22) PCT Filed: **Sep. 5, 2019**

(86) PCT No.: **PCT/CN2019/104600**

§ 371 (c)(1),
(2) Date: **Aug. 29, 2022**

Publication Classification

(51) **Int. Cl.**
H03H 3/02 (2006.01)

(52) **U.S. Cl.**
CPC ***H03H 3/02*** (2013.01); *H03H 2003/021* (2013.01); *H03H 9/02015* (2013.01)

(57) **ABSTRACT**

A method for forming a bulk acoustic wave resonance device, comprising: (S**201**) forming a first layer, which comprises: providing a first substrate; forming a piezoelectric layer located on the first substrate; forming a first electrode layer located on the piezoelectric layer; and forming a cavity pre-treatment layer located on the piezoelectric layer, used for forming a cavity, and at least covering a first end of the first electrode layer, wherein a first side of the first layer corresponds to the side of the first substrate; a second side of the first layer corresponds to the side of the cavity pre-treatment layer; (S**203**) forming a second layer, which comprises: providing a second substrate; (S**205**) connecting the first layer to the second layer, the second layer being located at the second side; (S**207**) removing the first substrate, so that the first side corresponds to the side of the piezoelectric layer; and (S**209**) forming a second electrode layer located at the first side and contacting with the piezoelectric layer. The formed piezoelectric layer does not comprise a crystal that is significantly turned so as to facilitate increasing the electromechanical coupling coefficient and the Q value of the resonance device. In addition, the second substrate processing and the active layer processing can be respectively performed, and are flexible.