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(54) Title: A MULTI-FUNCTIONAL SENSOR FOR MOLECULAR SPECTROSCOPY

(57) Abstract: A sensor substrate includes: a base of silicon; and a plurality of bars. Each of the plurality of bars may be formed of at least a first noble metal. The plurality of bars may be disposed on a first area of the base in an array of units. Each of the units may include: at least one long bar; and at least one short bar. The short bar is shorter in length than the long bar. The array may be a periodic array characterized by a surface enhanced infrared absorption (SEIRA) resonance in an infrared (IR) spectrum. Each of the plurality of bars may include at least one interface characterized by a surface enhanced Raman spectroscopy (SERS) resonance.



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