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(54) **NANOPARTICLE PROBES, METHODS, AND SYSTEMS FOR USE THEREOF**

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See application file for complete search history.

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(57) **ABSTRACT**

Methods of identifying geological materials of interest comprising (i) providing a nanoprobe composition comprising one or more nanoprobe; wherein the nanoprobe includes (a) at least one tag; and (b) at least one signal generator; (ii) introducing the nanoprobe to a geological material; and (iii) detecting the presence of a signal generated by the signal generator on association of the tag with a target. Nanoprobe compositions identify geological materials, systems include such nanoprobe compositions, and methods use such nanoprobe compositions for the evaluation of geological materials.

**35 Claims, 3 Drawing Sheets**

