CLAIMS

1. A gel having a composition comprising a halide perovskite material and clay; wherein the clay comprises clay nanoparticles having a size of less than 50 nm.

2. The gel as claimed in claim 1, wherein a weight of the clay is between about 1% and about 3% of a weight of the halide perovskite material.

3. The gel as claimed in claim 1, wherein the gel comprises a solvent.

4. The gel as claimed in claim 1, wherein the clay comprises cationic clay or anionic clay.

5. The gel as claimed in claim 1, wherein the halide perovskite material comprises an organic cation.

6. The gel as claimed in claim 1, wherein the halide perovskite material comprises one or more halide anions selected from the group consisting of F^-, I^-, Cl^- and Br^-.

7. A method of forming a gel comprising:
providing a halide perovskite material;
providing clay including clay nanoparticles having a size of less than 50 nm; and
mixing the halide perovskite material and the clay together to form the gel.

8. The method as claimed in claim 7, wherein a weight of the clay is between about 1% and about 3% of a weight of the halide perovskite material.

9. The method as claimed in claim 7, wherein providing a halide perovskite material comprises mixing one or more precursor materials of the halide perovskite material in a solvent to form the halide perovskite material.

10. The method as claimed in claim 9, further comprising subjecting the mixture of the one or more precursor materials and the solvent to a heating process.

11. The method as claimed in claim 7, wherein mixing the halide perovskite material and the clay comprises subjecting the halide perovskite material and the clay to a sonication process.

12. The method as claimed in claim 11, wherein mixing the halide perovskite material and the clay further comprises stirring the halide perovskite material and the clay prior to the sonication process.

13. The method as claimed in claim 7, wherein providing clay comprises providing a cationic clay or an anionic clay.

14. The method as claimed in claim 7, wherein the halide perovskite material comprises an organic cation.

15. The method as claimed in claim 7, wherein the halide perovskite material comprises one or more halide anions selected from the group consisting of F^-, I^-, Cl^- and Br^-.

16. A photovoltaic device comprising:

a substrate; and

a perovskite layer on the substrate, wherein the perovskite layer is made of the gel as claimed in claim 1, the gel having been heat treated to form the perovskite layer.

17. A method of forming a photovoltaic device, the method comprising:

applying a gel as claimed in claim 1 on a substrate; and

performing a heat treatment on the gel to form a perovskite layer on the substrate.

18. The method as claimed in claim 17, wherein applying a gel comprises printing the gel on the substrate.