CLAIMS

1. A process for modifying a layered double hydroxide (LDH), the process comprising,

   a. providing a water-wet layered double hydroxide of formula:

   $$[M^{z+}_{1-x}M'^{y+}_{x}(OH)_2]^{a+}(X^{n-})_{a/r}\bullet bH_2O \qquad (1)$$

   wherein M and M' are metal cations, z = 1 or 2; y = 3 or 4, x is 0.1 to 1, preferably x<1, more preferably x = 0.1 - 0.9, *b* is 0 to 10, X is an anion, r is 1 to 3, n is the charge on the anion X and a is determined by x, y and z, preferably a = z(1-x)+xy-2;

   b. maintaining the layered double hydroxide water-wet; and

   c. contacting the water-wet layered double hydroxide with at least one organic solvent, the solvent being miscible with water and having a solvent polarity (P') in the range 3.8 to 9, wherein contacting the water-wet layered double hydroxide with the solvent comprises dispersing the layered double hydroxide in the at least one solvent.

2. The process as claimed in claim 1, wherein M is Mg, Zn, Fe, Ca or a mixture of two or more thereof.

3. The process as claimed in any one of the preceding claims, wherein M' is Al, Ga, Fe or a mixture of Al and Fe.

4. The process as claimed in any one of the preceding claims, wherein z is 2 and M is Ca, Mg, or Zn.

5. The process as claimed in any one of the preceding claims wherein M' is Al.

6. The process as claimed in any one of the preceding claims, wherein M is Zn, Mg or Ca, and M' is Al.

7 The process as claimed in any one of the preceding claims, wherein X is selected from halide, inorganic oxyanions, anionic surfactants, anionic chromophores, and/or anionic UV absorbers.

8. The process as claimed in claim 7, wherein the inorganic oxyanion is carbonate, bicarbonate, hydrogenphosphate, dihydrogenphosphate, nitrite, borate, nitrate, sulphate or phosphate or a mixture of two or more thereof.

9. The process as claimed in claim 7, wherein the inorganic oxyanion is carbonate, bicarbonate, hydrogenphosphate, dihydrogenphosphate, nitrite, nitrate, sulphate or phosphate or a mixture of two or more thereof.

10. The process as claimed in any one of the preceding claims, wherein the at least one solvent is selected from acetone, acetonitrile, dimethylformamide, dimethyl sulfoxide, dioxane, ethanol, methanol, n-propanol, 2-propanol, tetrahydrofuran or a mixture of two or more thereof.

11. The process as claimed in any one of the preceding claims, wherein the at least one solvent is selected from acetone or ethanol.

12. The process as claimed in any one of the preceding claims, further comprising a step of drying the LDH obtained in step c.

13. The process as claimed in any one of the preceding claims, further comprising subjecting the layered double hydroxide to a thermal treatment, preferably calcination.

14. A layered double hydroxide, prepared according to the process of any of the preceding claims, wherein the layered double hydroxide has a BET pore volume (N_2) in a range of 0.5 cm^3/g to 3.5 cm^3/g.

15. The layered double hydroxide as claimed in claim 14 having a specific surface area (N_2) of greater than 155 m^2/g.

16. The layered double hydroxide as claimed in claim 14 or 15, wherein the layered double hydroxide has specific surface area (N_2) of 170 m^2/g - 700 m^2/g.

17. The layered double hydroxide as claimed in claim 14 or 15, wherein the layered double hydroxide has specific surface area (N_2) of 250 m^2/g - 650 m^2/g.

18. The layered double hydroxide as claimed in claim 14 - 17, wherein the layered double hydroxide has an apparent density of 0.8 g/cm^3 or lower.

19. The layered double hydroxide as claimed in claim 14 - 17, wherein the layered double hydroxide has a de-aggregation factor greater than 2.

20. The layered double hydroxide as claimed in any one of claims 14 - 19, which has been subjected to a thermal treatment, preferably calcination.