Claims

1. A method of forming a metal doped powdered activated carbon (PAC) catalyst for catalytic ozonation, the method comprising:
    - mixing a metal ion solution in an acidic solvent to form a first mixture;
    - adding powdered activated carbon (PAC) to the first mixture to form a second mixture;
    - adding an organic solvent to the second mixture to form a xerogel;
    - drying the xerogel; and
    - calcinating the xerogel to form the metal-doped PAC catalyst.

2. The method according to claim 1, wherein the acidic solvent is: citric acid, acetic acid, formic acid, oxalic acid, propionic acid, lactic acid or a combination thereof.

3. The method according to claim 1 or 2, further comprising ultrasonicating the second mixture prior to the adding an organic solvent.

4. The method according to any of claims 1 to 3, wherein the organic solvent is: ethylene glycol, glycerol, 1,2-propane diol, triethylene glycol, polyethylene glycol, or a combination thereof.

5. The method according to any of claims 1 to 4, wherein the calcinating is at a temperature of 400-800°C.

6. The method according to any of claims 1 to 5, wherein the method further comprises pelletizing the catalyst.

7. A catalytic ozonation system for wastewater treatment comprising:
    - a wastewater inlet for receiving wastewater;
    - an ozone inlet for receiving ozone gas;
    - an ozone reactor for catalytic ozonation of wastewater, the ozone reactor in fluid communication with the wastewater inlet and the ozone inlet, wherein the ozone reactor is loaded with a metal doped powdered activated carbon (PAC) catalyst having an average size of 5-150 mm; and
    - a water outlet for discharging treated wastewater.

8. The system according to claim 7m, wherein the system further comprises a microbubble generator in fluid communication with the ozone inlet for forming ozone microbubbles.

9. A method for catalytic ozonation comprising ozonising wastewater over a metal doped powdered activated carbon (PAC) catalyst having an average size of 5-150 mm.