CLAIMS

1. A process for the treatment of a water, said process comprising:

- an adsorption stage in which the water is brought into contact with a fresh adsorbent, the water being known as "preadsorbed water" before it is brought into contact with the fresh adsorbent and being known as "adsorbed water" after it has been brought into contact with the fresh adsorbent,
- a recirculation stage in which at least a portion of the fresh adsorbent brought into contact with the water during the adsorption stage is withdrawn, this withdrawn portion constituting a spent adsorbent, and
- a coagulation stage in which the preadsorbed water is brought into contact with one or more coagulants,

wherein, during the recirculation stage, the spent adsorbent is brought into contact with the preadsorbed water,

and the preadsorbed water is not subjected to any clarification stage in which there is removed from the water at least a portion of suspended matter which it contains.

2. The process as claimed in claim 1, wherein the adsorbent is a powdered activated carbon.

3. The process as claimed in claim 1 or 2, wherein it additionally comprises a clarification stage in which the adsorbed water is separated from the suspended matter which it contains.

4. The process as claimed in any one of claims 1 to 3, wherein it additionally comprises a stage of maintenance of coagulant-water contact in which the preadsorbed water which has been subjected to the coagulation stage is

stored in a chamber for a period of time greater than 1 minute, advantageously greater than 5 minutes, more advantageously equal to 10 minutes.

5. The process as claimed in any one of claims 1 to 4, wherein it additionally comprises a flocculation stage in which the adsorbed or preadsorbed water is brought into contact with a flocculating agent.

6. The process as claimed in claim 5, wherein the flocculation stage is carried out after the stage of maintenance of coagulant-water contact.

7. The process as claimed in one of claims 1 to 6, wherein the water is:

- an urban or industrial wastewater, or
- a surface or underground water intended for the production of drinking water or for an industrial use.

8. A plant for the treatment of a water, this plant being arranged in order to carry out a process as claimed in one of claims 1 to 7, this plant comprising:

- an adsorption zone (1) capable of bringing the water into contact with a fresh adsorbent,
- a recirculation branch (2a, 2b, 2c, 2d) capable of withdrawing at least a portion of the fresh adsorbent brought into contact with the water in the adsorption zone (1),the recirculation branch (2a, 2b, 2c, 2d) being arranged in order to bring the withdrawn portion of the adsorbent into contact with the water located upstream of the adsorption zone (1), and
- a coagulation zone (4) being arranged to bring into contact the preadsorbed water with one or more coagulants, the coagulation zone being upstream of the adsorption zone (1),

the plant not comprising, upstream of the adsorption zone (1), a clarification structure arranged in order to remove, from the water, at least a portion of suspended matter which it contains.