CLAIMS

1. Water treatment method for simultaneous abatement of carbon, nitrogen and phosphorus, implemented in a sequencing batch moving bed biofilm reactor (SBMBBR) comprising carriers suitable for the development of a biofilm,

said method comprising sequences of successive treatments, each treatment sequence comprising:

- an initial phase of anaerobic treatment,
- said initial phase of anaerobic treatment being followed by at least one aerobic/anoxic cycle consisting of:
- an aerobic treatment phase so as to obtain an ammonium ion concentration that does not pass below a threshold concentration of ammonium ions; and
- a phase in which the biofilm is placed, at least locally, under anoxic conditions, this phase being concomitant with or posterior to said aerobic treatment phase;

the threshold concentration of ammonium ions being calculated to allow the development of anammox microorganisms during the phase in which the biofilm is placed, at least locally, under anoxic conditions.

2. Method according to claim 1, wherein the threshold concentration of ammonium ions is ≥ 1mg N/L and preferably ≥ 2mg N/L**.**

3. Method according to claim 1 or 2 wherein, for each treatment sequence the SBMBBR has a volume exchange ratio (ERV) comprised between 90% and 100%.

4. Method according to any one of claims 1 to 3, wherein for each biological treatment cycle, the anaerobic treatment phase lasts from 30 minutes to 5 hours and
the at least one aerobic/anoxic cycle lasts from 1 hour to 10 hours.

5. Method according to any one of claims 1 to 4, wherein for each cycle of the at least one aerobic/anoxic treatment cycle, the phase in which the biofilm is placed under anoxic conditions is posterior to the aerobic phase, and
the ratio between the duration of the aerobic phase and the total duration of the aerobic-anoxic phase is between 0.2 and 0.8.

6. Method according to any one of claims 1 to 5, wherein said carriers are capable due to their geometry to remain in close proximity to each other when aeration intensity is moderate, thus forming local anoxic conditions during an aerobic treatment phase.

7. Method according to any one of claims 1 to 6, wherein there is no pre-seeding with anammox and DPAO microorganisms.

8. Method according to any one of claims 1 to 7, wherein there is no addition of an external source of carbon and/or there is no addition of an external source of metal salts.