CLAIMS

1. A process for the treatment of effluents containing nitrogen in the form of ammonium, using chemical oxidation and reduction reactions in a sequencing batch reactor (1), the process comprising:

- a feed step (2), during which a volume of effluents to be treated is introduced into the reactor (1),
- at least one first aeration step (10), during which oxygen or air is injected into the reactor (1) for a partial oxidation of the ammonium to give nitrites and/or nitrates,
- a second anoxic step (20), during which, by interrupting the injection of oxygen or air, nitrogen gas is produced,
- a settling step (30), during which sludge is deposited at the bottom of the reactor (1) and the content of the reactor clarifies close to the surface thereof,
- a draining step (40), during which a clarified fraction of the content of the reactor is evacuated,

said draining step (40) and feed step (2) taking place simultaneously,

wherein during the feed step (2), the volume of effluents to be treated is introduced close to the bottom of the reactor (1),

wherein during the draining step (40), the clarified fraction of the content of the reactor is evacuated at a predefined evacuation level (42) close to the surface of the content of the reactor,

and wherein the level of the content of the reactor is kept substantially constant during the draining step (40) and feed step (2).

2. The process according to claim 1, wherein the volume of effluents to be treated is introduced into the sludge bed in the reactor, preferably intimately and uniformly so

as to favor the homogenization of the sludge with the effluents.

3. The process according to claim 1 or 2, wherein the volume of effluents to be treated is introduced via an injection directed toward a bottom of the reactor (1) so as to generate turbulences in the sludge bed found at the bottom of the reactor (1).

4. The process according to any one of claims 1 to 3, wherein the volume of effluents to be treated is introduced through at least one feed tube (4) that is perforated with holes oriented toward the bottom of the reactor.

5. The process according to claim 4, wherein said holes are provided with baffles, each hole being capable of giving rise to turbulences over substantially 10 m^2 of the bottom of the reactor (1).

6. The process according to any one of the preceding claims, wherein the feed step (2) and draining step (40) are stopped when the sludge bed in the reactor expands above a reference level (32) in the reactor (1), the reference level (32) being chosen at a predetermined distance below an evacuation level (42) where the content is drawn off during the draining step (40).

7. The process according to claim 6, wherein the level of the sludge bed in the reactor (1) is detected by a suspended matter sensor placed at the reference level (32).

8. The process according to claim 7, wherein the suspended matter sensor detects the sludge concentration, the sludge concentration preferably being between 1 and 10 g/l.

9. The process according to any one of the preceding claims, wherein a reactor bottom sensor detects the thickness of the sludge bed in the reactor, and the sludge is discharged when the thickness exceeds a

predetermined threshold.

10. The process according to any one of the preceding claims, wherein the content evacuated during the draining step (40) is sent back to the feed step (2) if the content evacuated has a sludge concentration substantially greater than a predetermined value.

11. A plant for the treatment of effluents containing nitrogen in the form of ammonium, wherein it comprises a sequencing batch reactor (1), a device (3) for feeding a volume of effluents close to the bottom of the reactor (1), a system (41) for recovering a clarified fraction of the content of the reactor comprising a perforated tube comprising one or more inlet orifices located in the reactor (1) at a distance as small as possible below the surface of the content of the reactor (1), a sludge extraction system (51) and aeration means (11),

the reactor (1) being arranged and equipped for the implementation of a process according to any one of claims 1 to 10.