CLAIMS

1. A wastewater treatment process comprising at least one step of aerobic biological treatment of wastewater in a biological reactor, and further comprising an ozonation step during which ozone is directly injected and without a specific ozone contactor, wherein without a specific ozone contactor means without a device comprising an enclosure in which the fluid to be treated is retained for a determined duration before being contacted with ozone, in one or more circuits arranged to convey wastewater into the biological reactor, an ozone chemical oxidation acting synergistically with the biological oxidation within the biological reactor, without a specific ozone contactor,

- the ozonation step including injecting ozone in a wastewater inlet circuit by means of a first type injector or static mixer injection device,

- the amount of ozone injected into the wastewater inlet circuit during the ozonation step being lower than or equal to two grams per gram of total organic carbon of the wastewater.

2. The process according to claim 1, further comprising a separation step during which sludge is separated from the wastewater, this separation step being subsequent to the at least one aerobic biological treatment step, wherein the sludge from this separation step is conveyed in the biological reactor by a recirculation circuit, and wherein the ozonation step includes injecting ozone in this recirculation circuit by means of a second type injector or static mixer injection device.

3. The process according to claim 2, wherein the ozone amount injected in the recirculation circuit during the ozonation step is lower than or equal to two grams per gram of total organic carbon of the wastewater.

4. The process according to any of claims 1 to 3, further comprising an ozonation post-treatment step during which the wastewater exiting the biological reactor is contacted with ozone within an ozone contactor.

5. The process according to claim 4, wherein the ozone amount contacted with the wastewater in the ozone contactor during the ozonation post-treatment step is lower than or equal to two grams per gram of total organic carbon of the wastewater.

6. The process according to claim 4 or 5 considered as depending on claim 2, further comprising a gas recycling step during which at least one part of the ozone contacted with the wastewater in the ozone contactor is recirculated to the first and/or the second injection device, and/or is injected in an aeration zone of the biological reactor.

7. The process according to any of claims 1 to 6, wherein the ozone injected is gaseous or dissolved.

8. The process according to any of claims 1 to 7, wherein the ozone injected is a gas comprising oxygen.