

CLAIMS

1. A catalytic reactor comprising an enclosure (1) comprising at least two beds of solid catalyst (2; 11) separated by an intermediate zone comprising a collector plate (6) cooperating with a quench box (7) disposed below the collector plate (6), the reactor comprising a nozzle (5) for injecting a quench fluid, characterized in that the nozzle (5) is disposed in a collecting region (4) located in the intermediate zone above the collector plate (6), in that the injection nozzle (5) consists of a bent tube comprising a single orifice discharging into the collecting region, the orifice being located at the end of the tube, in that the maximum distance between the enclosure (1) and the injection nozzle (5) is in the range 0 to 40 cm, and in that the end of the injection nozzle (5) comprises a tubular portion configured so as to inject the quench fluid into the collecting region (4) in a substantially horizontal direction and forming an angle in the range -10° to $+10^{\circ}$ with respect to the direction tangential to the inner surface of the wall of the enclosure (1) at the level of the outlet of the said tubular portion so as to generate a rotational flow over the collector plate (6).
2. A reactor according to claim 1, characterized in that the nozzle (5) discharges at the wall of the enclosure (1) so as to inject a fluid in a direction forming an angle in the range -10° to $+10^{\circ}$ with respect to the horizontal direction.
3. A reactor according to claim 1 or claim 2, characterized in that the end of the injection nozzle (5) is composed of a straight tubular portion forming an angle (θ) in the range -10° to $+10^{\circ}$ with respect to the direction tangential to the wall of the enclosure (1) at the level of the nozzle orifice.
4. A reactor according to claim 3, characterized in that the straight tubular portion forms an angle in the range -10° to $+10^{\circ}$ with respect to the horizontal direction.
5. A reactor according to one of the preceding claims, characterized in that the nozzle (5) forms a tube with a length in the range 5 cm to 50 cm, measured in the collecting region (4).

6. A reactor according to one of the preceding claims, characterized in that the nozzle (5) is disposed at a distance of less than 30 cm from the enclosure and at a distance of less than 20 cm from the collector plate (6).
7. A reactor according to one of the preceding claims, comprising a distributor plate (9) for gas and liquid disposed beneath the quench box (7).
8. A reactor according to claim 7, comprising a perforated plate (8) disposed between the quench box (7) and the distributor plate (9).
9. A method for deploying a reactor according to one of claims 1 to 8, characterized in that a fluid comprising at least 70% by volume of liquid is injected via said nozzle (5).
10. A method according to claim 9, in which a fluid is injected via said nozzle (5) at a rate in the range 1 to 15 m/s.
11. A method of obtaining a reactor according to one of claims 1 to 8, in which an existing reactor is revamped by replacing the old nozzle with an injection nozzle (5) the end of which comprises a tubular portion configured so as to inject the fluid into the collecting region in a substantially horizontal direction and forming an angle in the range -10° to $+10^{\circ}$ with respect to the direction tangential to the wall of the enclosure at said tubular portion.