

Claims

1. Apparatus (1) for providing ultrapure water, in particular ultrapure water for use in semiconductor fabrication, comprising at least one cylindrical reactor (2) with an inner cylindrical shell (3), an outer cylindrical shell (4) and a channel-like volume (5) between inner shell (3) and outer shell (4), wherein
- said inner cylindrical shell houses at least one UV emission device (6),
 - said outer cylindrical shell comprises at least one means (7) for reflecting UV radiation, and
 - said channel-like volume (5) is provided for flowing water through the reactor (2).
2. Apparatus according to claim 1, wherein said inner cylindrical shell (3) is made from synthetic crystalline SiO₂, preferably with a maximum UV transmission rate.
3. Apparatus according to claim 1 or claim 2, wherein said UV emission device (6) has an emission spectrum with wave lengths ≤ 380 nm, preferably with emission peaks ≤ 200 nm, in particular with emission peaks of 185 nm and 254 nm.
4. Apparatus according to anyone of the preceding claims, wherein said outer cylindrical shell (4) is made from SiO₂, preferably with an UV transmission rate lower than that of synthetic crystalline SiO₂.
5. Apparatus according to anyone of the preceding claims, wherein said means for reflecting UV radiation is at least one coating (7), preferably made from amorphous SiO₂.
6. Apparatus according to anyone of the preceding claims, wherein said means for reflecting UV radiation are provided at the outer surface of said outer cylindrical shell (4).
7. Apparatus according to anyone of the preceding claims, wherein said channel-like volume (5) has a width between 0.1 mm and 100 mm, preferably between 2 mm and 50 mm, in particular between 2 mm and 15 mm.
8. Apparatus according to anyone of the preceding claims, wherein said channel-like volume is made up from at least two chamber-like sections which are arranged in series.
9. Apparatus according to anyone of the preceding claims, wherein said channel-like volume (5) comprises means (14) for generating a turbulent flow of flowing water in said

volume, wherein preferably said means are spiral components, in particular spiral components made from SiO₂.

10. Apparatus according to anyone of the preceding claims, wherein said cylindrical reactor
5 (2) further comprises a cylindrical shield (10) enclosing said outer cylindrical shell (4), wherein preferably said shield is made from plastic or has a surface made from plastic.
11. Apparatus according to anyone of the preceding claims, wherein said cylindrical reactor
10 (11) is contained in a vessel (11), in particular a cylindrical vessel (11), wherein in particular said vessel is made from plastic or has a surface made from plastic.
12. Apparatus according to claim 11, wherein at least part of the volume (12) between said
15 vessel (2) and said outer cylindrical shell (4) or between said vessel (11) and said shield (10) enclosing said outer cylindrical shell (4) is provided for at least one further treating step of said water flowing through the reactor.
13. Apparatus according to claim 12, wherein said volume (12) is filled at least partly with at least one adsorbing material (13), preferably at least one ion exchange resin.
- 20 14. Apparatus according to claim 12 or claim 13, wherein said volume (12) is filled at least partly with at least one catalyst (13), wherein preferably said catalyst is immobilized on a support.
- 25 15. Method for providing ultrapure water, in particular ultrapure water for use in semiconductor fabrication, wherein water is flown through a channel-like volume (5) provided between an inner cylindrical shell (3) and an outer cylindrical shell (4) of a cylindrical reactor (2) in an apparatus (1) according to at least one of claims 1 to 14.
- 30 16. Use of an apparatus according to anyone of claims 1 to 14 in the production of ultrapure water, in particular in the production of ultrapure water for use in semiconductor fabrication, wherein contact of said ultrapure water with metals or alloys is minimized or avoided.
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