CLAIMS

1. A method for the manufacture of a semiconductor, a micro-electromechanical system, TFT (flat panel display) or a solar cell comprising a step of etching an item with fluorine, or a method for the manufacture of a semiconductor, a micro-electromechanical system, a TFT (flat panel display) or a solar cell comprising a step of depositing layers on items in a deposition chamber wherein deposits form at least on a part of the interior of the deposition chamber, and contacting said deposition chamber, with fluorine purified according to Aa process ~~for the manufacture of purified fluorine~~ wherein fluorine which contains solid impurities is subjected to a solid-removing treatment wherein the solid-removing treatment comprises at least one step of contacting the fluorine with liquid hydrogen fluoride, and wherein the fluorine is subsequently subjected to a purification treatment comprising at least one step of removing hydrogen fluoride from the fluorine after contact with liquid hydrogen fluoride, and wherein~~, optionally,~~ the fluorine is subjected to a step of contacting it with sodium fluoride~~an adsorbent for HF~~, and wherein~~, optionally,~~ the fluorine is subjected to a step of passing it through a particle filter for the removal of entrained solids.

2. The process of claim 1 wherein the fluorine is contacted with liquid hydrogen fluoride in a jet gas scrubber.

3. The process of claim 1 wherein the fluorine is contacted with liquid HF by bubbling it through liquid HF in a vessel.

4. The process of anyone of claims 1 to 3 wherein the at least one step of removing hydrogen fluoride is a low temperature treatment.

~~5. The process of any one of claims 1 to 4 wherein the process comprises at least one step of contacting the fluorine, after the treatment with liquid HF, with an adsorbent for HF, and subsequently at least one step of passing the fluorine through a particle filter for the removal of entrained solids.~~

~~6~~5. The process of anyone of claims 1 to ~~5~~4 wherein the purification treatment comprises: at least one step of a low temperature treatment, at least one subsequent step of contacting the fluorine after the low temperature treatment with an adsorbent for HF, and, after the contact of the fluorine with the adsorbent for HF, at least one subsequent step of passing the fluorine through a particle filter to provide highly pure fluorine.

~~7~~6. The process of claims ~~5~~4 or ~~6~~5 wherein the particle filter to provide highly pure fluorine comprises pores having a diameter less than 1 μm.

~~8~~7. The process of claim ~~7~~6 wherein the particle filter comprises pores having a diameter less than 10 nm.

~~9. The process of anyone of claims 5 to 8 wherein the adsorbent for HF is sodium fluoride.~~

8~~10~~. The process of any one of claims 1 to 9~~7~~ wherein continuously or intermittently, at least a part of the liquid HF is withdrawn from the solid removing treatment, and wherein withdrawn HF is introduced into an electrolytic cell or into electrolytic cells for F_2 production.

9~~11~~. The process of any one of claims 1 to 8~~10~~ wherein the fluorine is electrolytically produced in one or more electrolytic cells from an electrolyte containing KF dissolved in HF.

10~~12~~. The process of claim 9~~11~~ wherein the fluorine electrolytically produced is passed through a particle filter and is subsequently subjected to the solid removing treatment and the purification treatment.

11~~13~~. The process of claims 9~~11~~ or 10~~12~~ wherein the fluorine electrolytically produced is passed through a particle filter and subsequently subjected to the solid removing treatment comprising at least one step of contacting the fluorine with liquid hydrogen fluoride in a jet gas scrubber or by bubbling the fluorine through liquid HF in a vessel, subjecting the fluorine after the treatment with liquid HF to a low temperature treatment, subsequently contacting the fluorine with NaF as adsorbent for HF, and subsequently passing the fluorine through at least one particle filter having pores with a diameter of less than 1 μm.

~~14. A method for the manufacture of a semiconductor, a micro-electromechanical system, TFT (flat panel display) or a solar cell comprising a step of etching an item with fluorine, or a method for the manufacture of a semiconductor, a micro-electromechanical system, a TFT (flat panel display) or a solar cell comprising a step of depositing layers on items in a deposition chamber wherein deposits form at least on a part of the interior of the deposition chamber, and contacting said deposition chamber, with fluorine purified according to the method of any one of claims 5 to 13 to remove at least a part of the deposits in the interior of the deposition chamber.~~

12~~15~~. The method of claim 4 wherein the pressure is equal to or greater than 1 and equal to or lower than 20 bar (abs), preferably equal to or lower than 12 bar (abs).