

Title (en)

METHOD FOR FILLING CSAC ABSORPTION CELLS WITH HIGH-PURITY ALKALI METAL

Title (de)

VERFAHREN ZUM FÜLLEN VON ABSORPTIONSZELLEN EINER CHIP-SKALIERTEN ATOMUHR MIT HOCHREINEM ALKALIMETALL

Title (fr)

PROCÉDÉ DE REMPLISSAGE DE CELLULES D'ABSORPTION D' UN CSAC AVEC UN MÉTAL ALCALIN À HAUTE PURETÉ

Publication

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Application

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Priority

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Abstract (en)

[origin: EP3112315A1] A method for filling, on a wafer, chip-level atomic clock absorption bubbles with a high-purity alkali metal. The method comprises: 1) forming a micro groove (102), an absorption bubble cavity groove and an accommodation cavity groove in a silicon wafer (101); 2) sealing an alkali metal compound (106) in an accommodation cavity (103) in the center of the wafer, and forming a vacuum environment in the wafer comprising a temporary flowing micro channel, an absorption bubble cavity and the alkali metal accommodation cavity (103); 3) implementing decomposition of the alkali metal compound to generate a rubidium or cesium metal in a needed amount, and vaporizing and volatilizing the metal; 4) solidifying and coagulating the gaseous alkali metal in the absorption bubble cavity (104); and 5) bending a glass sheet under the action of electrostatic force, eliminating the precast temporary flowing micro channel (108), and simultaneously sealing all absorption bubbles. By means of the method, the problems of high filling difficulty, complex process and the like caused by extremely high probability of oxidization of an alkali metal are solved, reaction impurities probably left in the absorption bubbles are eliminated, and all the absorption bubbles on the alkali metal wafer are filled at a time, and the method can be used for mass production of chip-level atomic clock bubbles.

IPC 8 full level

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