Claims

[Claim 1]. A piezoelectric-on-insulator (POI) substrate comprising:

- a support substrate, in particular a silicon-based substrate,
- a piezoelectric layer, in particular a lithium tantalate (LTO) or lithium niobate (LNO) layer,
- a dielectric layer, in particular a silicon oxide layer, sandwiched between the piezoelectric layer and the support substrate,
- a trapping structure sandwiched between the dielectric layer and the support substrate comprising a first trapping layer based on polycrystalline or amorphous or porous silicon, preferably based on polycrystalline silicon, and

the trapping structure comprises a second trapping layer based on silicon carbide

characterized in that

the first trapping layer is positioned between the support substrate and the second trapping layer.

[Claim 2]. The piezoelectric-on-insulator (POI) substrate as claimed in claim 1, in which the second trapping layer is thinner than the first trapping layer.

[Claim 3]. The piezoelectric-on-insulator (POI) substrate as claimed in claim 1 or 2, in which the second trapping layer has a thickness of less than or equal to 500 nm, in particular a thickness of less than or equal to 200 nm, in particular a thickness of less than or equal to 50 nm.

[Claim 4]. The piezoelectric-on-insulator (POI) substrate as claimed in one of claims 1 to 3, in which the first trapping layer has a thickness of less than or equal to 2 µm, in particular a thickness of less than or equal to 1 µm.

[Claim 5]. The piezoelectric-on-insulator (POI) substrate as claimed in one of claims 1 to 4, in which the second trapping layer is formed directly on the first trapping layer.

[Claim 6]. The piezoelectric-on-insulator (POI) substrate as claimed in one of claims 1 to 5, in which the trapping structure comprises only the first trapping layer and the second trapping layer.

[Claim 7]. A process for manufacturing a piezoelectric-on-insulator (POI) substrate as claimed in one of claims 1 to 5, comprising the steps of:

- providing a support substrate, in particular a silicon-based substrate,
- providing a substrate comprising a piezoelectric layer, in particular a substrate comprising lithium tantalate (LTO) or lithium niobate (LNO),

- forming a trapping structure over the support substrate,
- forming a dielectric layer, in particular a silicon oxide layer, over the piezoelectric substrate and/or over the trapping structure,
- assembling the substrate comprising a piezoelectric layer with the support substrate such that the dielectric layer and the trapping structure are sandwiched between the piezoelectric layer and the support substrate,

the formation of the trapping structure involves forming a first layer based on polycrystalline or amorphous or porous silicon on the support substrate, preferably based on polycrystalline silicon, and, subsequently, forming a second trapping layer based on silicon carbide.

[Claim 8]. The process for manufacturing a piezoelectric substrate as claimed in claim 7, moreover comprising a step of:

- forming a weakened zone inside the piezoelectric layer, and
- fracturing along the weakened zone in order to separate a part of the piezoelectric layer from the remainder of the substrate comprising the piezoelectric layer after the assembling step to transfer the part of the piezoelectric layer onto the support substrate.