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ABSTRACT OF THE DISCLOSURE

METHOD OF AND APPARATUS FOR, MANUFACTURING FIELD EMISSION-TYPE ELECTRON SOURCE

An electron source 10 has an n-type silicon substrate 1, a drift layer 6 formed on one surface of the substrate 1, and a surface electrode 7 formed on the drift layer 6. A voltage is applied so that the surface electrode 7 becomes positive in polarity relevant to the substrate 1, whereby electrons injected from the substrate 1 into the drift layer 6 drift within the drift layer 6, and are emitted through the surface electrode 7. In a process for manufacturing this electron source 10, when the drift layer 6 is formed, a porous semiconductor layer containing a semiconductor nanocrystal is formed in accordance with anodic oxidation. Then, an insulating film is formed on the surface of each semiconductor nanocrystal. Anodic oxidation is carried out while emitting light that essentially contains a wavelength in a visible light region relevant to the semiconductor layer.

Fig. 1