

Title (en)  
Field emission cathode structure and method for production thereof

Title (de)  
Feldemissionskathodenstruktur und Herstellungsverfahren

Title (fr)  
Structure de cathode à émission de champ et méthode de fabrication

Publication  
**EP 0639847 B1 19970625 (EN)**

Application  
**EP 94306076 A 19940817**

Priority  
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• JP 33204393 A 19931227

Abstract (en)  
[origin: EP0639847A1] A field emission cathode which comprises an emitter provided with a sharp point for emission of electrons and a controlling gate electrode is composed of a supporting substrate (17), an emitter material layer (18) formed of an emitter material, superposed on and attached fast to the supporting substrate, and provided with an emitter hole (18a), an insulator layer (13) so formed on the surface of the emitter material layer (18) as to expose the tip part of the emitter projection (18a) therethrough, and an impurity diffusion layer (12) formed on the surface of the insulator layer (13) and enabled to function as an etching stopper layer. The method for the production of the field emission cathode comprises a step of forming a first hole (11a) pointed toward the tip thereof on a first supporting substrate (11), a step of forming the impurity diffusion layer (12) on the surface of the first supporting substrate (11), a step of forming the insulator layer (13) on the surface of the impurity diffusion layer (12), a step of depositing an emitter material layer (18) on the surface of the insulator layer including a hole while filling the hole with an emitter material thereby giving rise to a laminate, a step of integrally joining a second supporting substrate (17) to the surface of the emitter material layer (18) of the laminate, a step of removing by etching the first supporting substrate (11) thereby exposing the surface of the impurity diffusion layer (12) including the projection corresponding to the first hole (11a), and a step of selectively removing the impurity diffusion layer (12) and the insulator layer (13) thereby exposing a tip (18t) of the projection (18a) of the emitter layer (18). <IMAGE>

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Cited by  
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