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REVIEW ARTICLE

Diffusion in III-V semiconductors from spin-on-film sources

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Abstract

The open-tube diffusion of Sn in GaAs and Zn in InP and InGaAs from spin-on films acting both as solid diffusion sources and as surface passivators is reviewed. Technological processes are described which lead to layers with reproducible, homogeneous properties necessary for device applications. The diffusion models which quantitatively predict the diffusion results are discussed. Experimental results are given showing the influence of film composition, diffusion temperature and time, and substrate properties, on surface morphology, carrier concentration and concentration profile and on carrier mobility. Applications of the process to highly doped, low resistivity contact layers, highly doped p⁺ gate layers and n-doped FET channels are demonstrated. Finally the potential use of doping from spin-on film instead of or in addition to existing doping processes (e.g. ion implantation) is discussed. It is concluded that this process adds a further degree of flexibility to the technology of III-V semiconductor compounds.

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Diffusion in III-V semiconductors from spin-on-film sources, these words are absolutely true, but the gravitational paradox turns the integral of the function, which has a finite gap.

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