



## Halogen n -type doping of chalcopyrite semiconductors

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Citation: [Applied Physics Letters](#) 86, 042109 (2005); doi: 10.1063/1.1854218

View online: <http://dx.doi.org/10.1063/1.1854218>

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# Halogen *n*-type doping of chalcopyrite semiconductors

Stephan Lany, Yu-Jun Zhao, Clas Persson,<sup>a)</sup> and Alex Zunger<sup>b)</sup>

for the allowed range of

*Defect formation energies (Fig. 2).* For Fermi energies in the upper part of the band gap and halogen favored conditions [Fig. 2(a