

Simultaneous gettering and emitter formation in multicrystalline-Si wafers by annealing phosphorus doped amorphous silicon compounds

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Materials Science, Engineering, Physics • Applied Physics Letters

We demonstrate gettering of metal impurities in p-type multicrystalline silicon (mc-Si) wafers by annealing wafers that are surface passivated by double layers of amorphous silicon-based compounds acting as gettering sites. As inner layer we use a phosphorus-doped amorphous silicon-carbon-nitrogen alloy, providing surface passivation and acting as dopant source for the emitter formation during subsequent anneal. The outer layer is silicon nitride with antireflective properties. Anneals are done at 750, 800, and 850 °C for 30 and 60 min. The gettering effect is as good as for a conventional POCl₃ diffusion followed by extended gettering at low temperature, and it is weakly influenced by the temperature step chosen. In the range explored, the sheet resistances of the emitters and the junction depths lay between 3000 to 60 Ω/sq. and 100–300 nm, respectively. [Collapse](#)

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Investigation of charges carrier density in phosphorus and boron doped SiNx:H layers for crystalline silicon solar cells

B. Paviet-Salomon

S. Gall

A. Slaoui

Engineering, Materials Science · 2013

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Very low surface recombination velocity of crystalline silicon passivated by phosphorus-doped a-SiC_xN_y:H(n) alloys

R. Ferré

A. Orpella

+6 authors

R. Alcubilla

Materials Science, Engineering · 2008

Hydrogenated and phosphorus-doped amorphous silicon carbonitride films (a-SiC_xN_y:H(n)) were deposited by plasma-enhanced chemical vapor deposition (PECVD) on crystalline silicon surface in order to... [Expand](#)

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Improved Gettering Efficiency of Ni from Nickel-Mediated Crystallization Silicon Using Phosphorus-Doped Amorphous Silicon

Bau-Ming Wang

Y. S. Wu

Materials Science, Engineering · 2009

Ni-metal-induced lateral crystallization (NILC) has been utilized to fabricate polycrystalline silicon thin-film transistors. However, the NILC process often leads to Ni and NiSi₂ precipitates being... [Expand](#)

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Response to phosphorus gettering of different regions of cast multicrystalline silicon ingots

D. Macdonald

A. Cuevas

F. Ferrazza

Materials Science, Engineering · 1999

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Improved phosphorous gettering of multicrystalline silicon

P. Manshanden

L. J. Geerligs

Materials Science, Engineering · 2006

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Model describing phosphorus diffusion gettering of transition elements in silicon

W. Schröter

R. Kühnappel

Physics, Materials Science · 1990

We give experimental evidence for cobalt in silicon that each of the processes defining phosphorus diffusion

Internal gettering of iron in multicrystalline silicon at low temperature

R. Krain S. Herlufsen Jan Schmidt Physics, Materials Science · 2008

The interstitial iron concentration in multicrystalline silicon wafers, determined from recombination lifetime measurements, is effectively reduced by annealing the wafers at very low temperature... [Expand](#)

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Fixed charge density in dielectrics deposited on c-Si using space charge region dominated lifetime measurements

M. Garín I. Martín S. Bermejo R. Alcubilla Physics, Engineering · 2007

Depletion region modulation (DRM) effect is often observed in photoconductance lifetime measurements of crystalline silicon wafers passivated by dielectric films. This effect is closely related to... [Expand](#)

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In situ-doped amorphous Si/sub 0.8/C/sub 0.2/ emitter bipolar transistors

A. Orpella D. Bardes R. Alcubilla L. Marsal J. Pallarès Engineering, Materials Science ·

[IEEE Electron Device Letters](#) · 1999

The fabrication and characterization of in situ-doped amorphous Si/sub 0.8/C/sub 0.2/ emitter transistors are presented. Emitter Gummel numbers exceeding 10^{14} s/cm² are reported for the... [Expand](#)

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A fast, preparation-free method to detect iron in silicon

G. Zoth W. Bergholz Materials Science, Physics · 1990

Iron is one of the most important impurities in silicon integrated-circuit technology. We present a fast (5 min), essentially preparation-free large-area (25 cm²) technique to determine the Fe... [Expand](#)

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Space-charge region-dominated steady-state photoconductance in low-lifetime Si wafers

M. Bail M. Schulz R. Brendel Physics, Engineering · 2003

We investigate the steady-state photoconductance of an oxidized low-lifetime monocrystalline Si wafer with an inversion layer at its surfaces. Photogenerated electrons and holes reduce the band... [Expand](#)

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