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## The use of diffusion barriers to control first phase formation in solid state reactions

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**Abstract content <br> &nbsp; (Max 300 words)<br><a href="http://events.saip.org.za/getFile.py/?target="\_blank">Formatting &<br>Special chars</a>**

Concentration controlled phase selection in solid state reaction has been proposed as a model to interpret first phase formation occurring at solid interfaces. This is done in the context of the effective heat of formation model. The results of solid state reactions between a thin film of Co and single crystalline Si substrates are presented. Various thicknesses of the same composition diffusion barrier (Fe<sub>90</sub>Zr<sub>10</sub>) were deposited on a Si substrate in a molecular beam epitaxial growth chamber. The formation of the various Co- silicides found at diffusion barrier interlayer's are interpreted in terms of the reduced flux of reactant atoms at the reaction interface. The reduced fluxes are due to the different thicknesses of the diffusion barriers. Samples were annealed for times ranging from 5 to 24 hrs at temperatures ranging from 350 - 800°C and the phase formation sequence was characterized by Rutherford backscattering spectrometry, scanning electron microscopy and X-ray diffraction.

**Apply to be<br> considered for a student <br> &nbsp; award (Yes / No)?**

yes

**Level for award<br>&nbsp;(Hons, MSc, <br> &nbsp; PhD)?**

PhD

**Main supervisor (name and email)<br>and his / her institution**

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**Would you like to <br> submit a short paper <br> for the Conference <br> Proceedings (Yes / No)?**

no

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