Determining the Activation Energy of Sn-Ti Solid Phase Reaction Using Femtosecond Laser

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Solid phase reaction of Sn-Ti system are usually studied under isothermal heat treatment, this can be achieved by using various heating set-ups and ramping the heat at a constant rate. The Solid phase reaction activation energy can then be determined from the onset of mixing between Ti and Sn. On the other hand, non-isothermal activation energy of solid phase reaction of Sn-Ti can also be determined using femtosecond laser as a heating source. In this instance the reaction takes place in out of thermodynamic equilibrium conditions.

In this study a solid phase reaction is tracked using Rutherford backscattering spectrometry, this uses energetic alpha particle to probes atomic depth profiling of the samples in order to detect the onset of the solid phase reaction. Figure 1 shows the plot of the RBS experiments of the laser heated its activation energies.

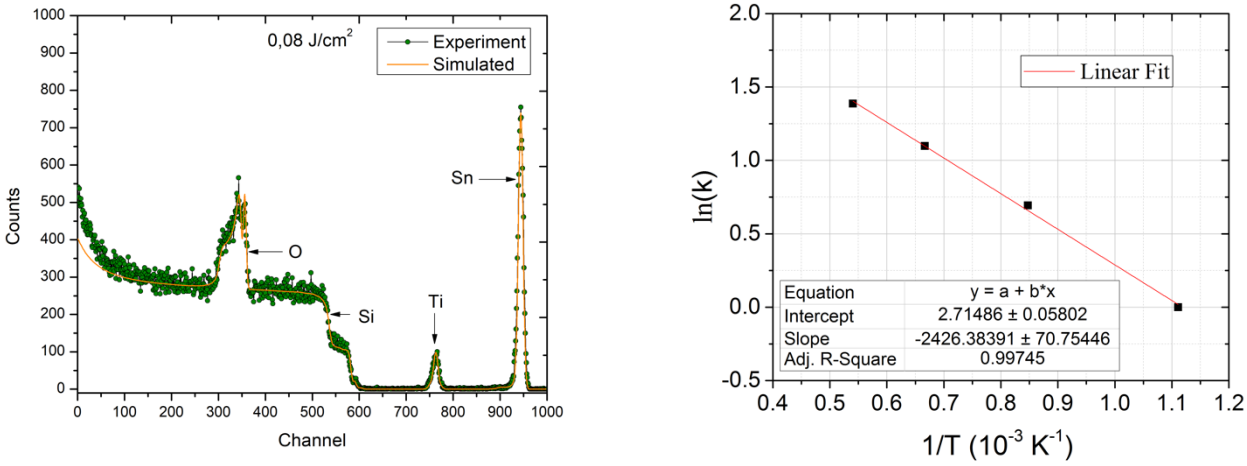

Figure.1 Rutherford backscattering spectrometry plot of the laser heated Sn-Ti sample for solid phase reaction and the activation energy plot.

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