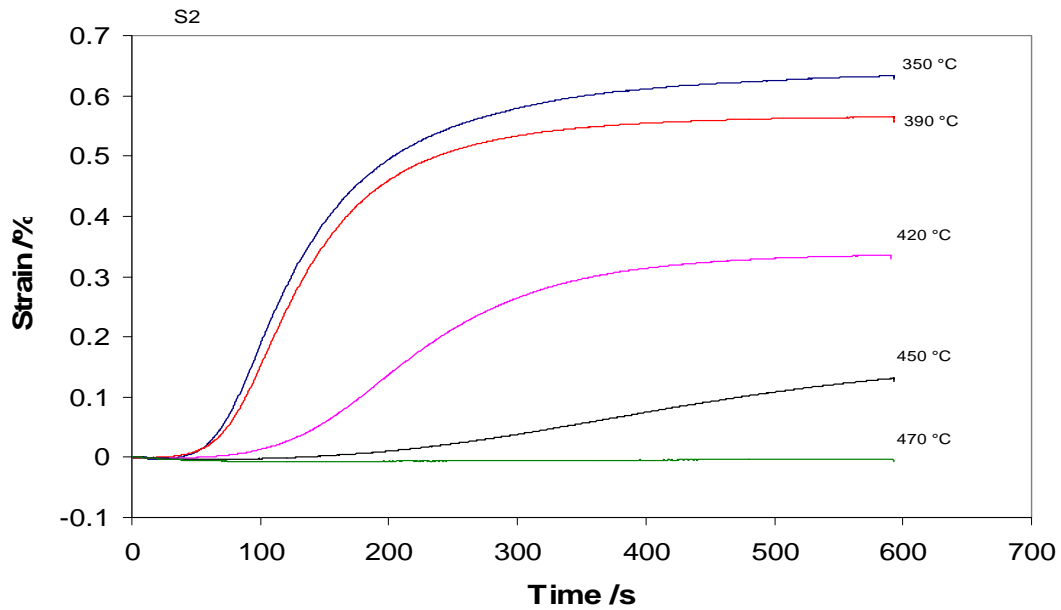
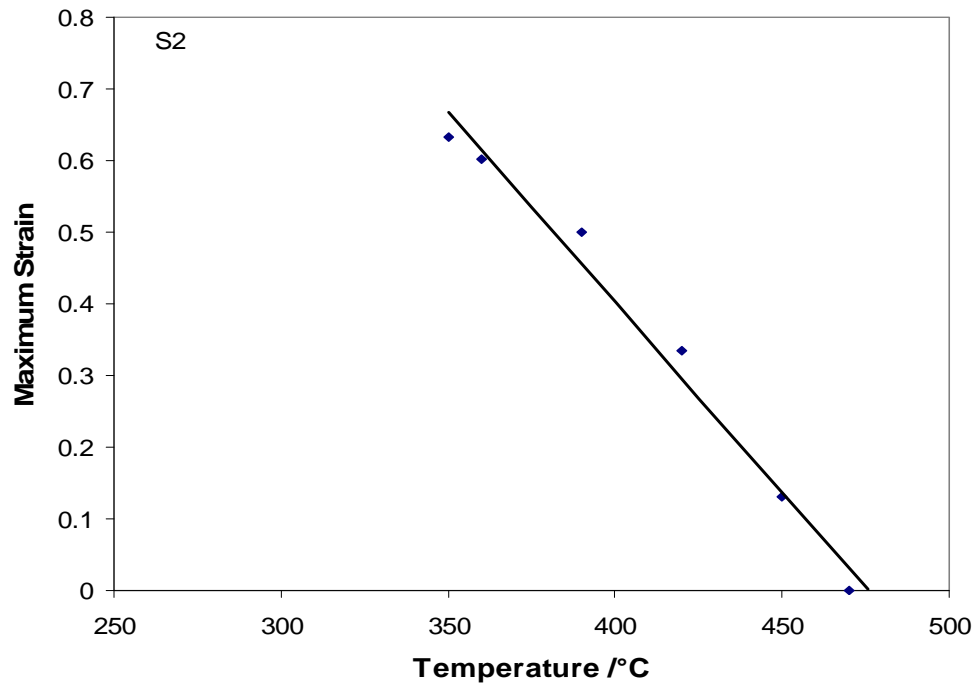


S2



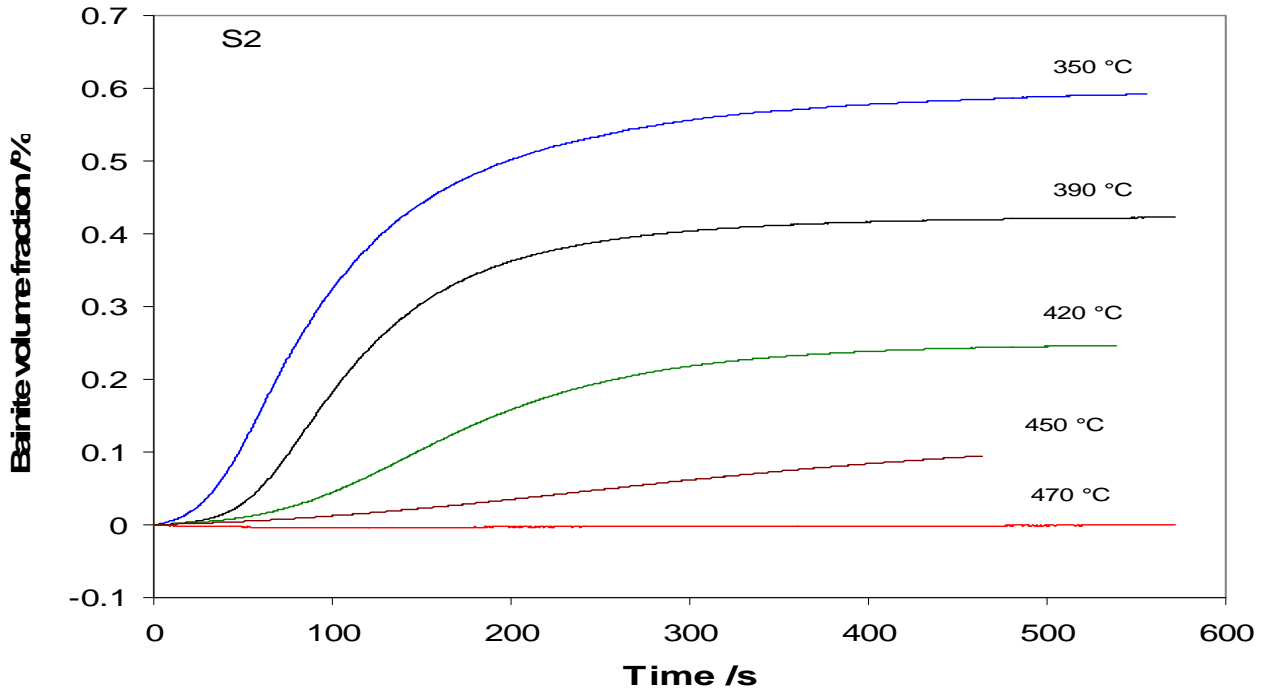
Isothermal transformation to bainite



Maximum strain at isothermal transformation of bainite

S2

Bainite volume fraction as a function of time.



Bainite volume fraction is calculated from the formula in paper, Mater. Sc & Tech.23, p556 (2007)

$$(1+e)^3 = a_\gamma^{-3} [2V a_\alpha^3 + (1-V) a_\gamma^3] \quad \text{where}$$

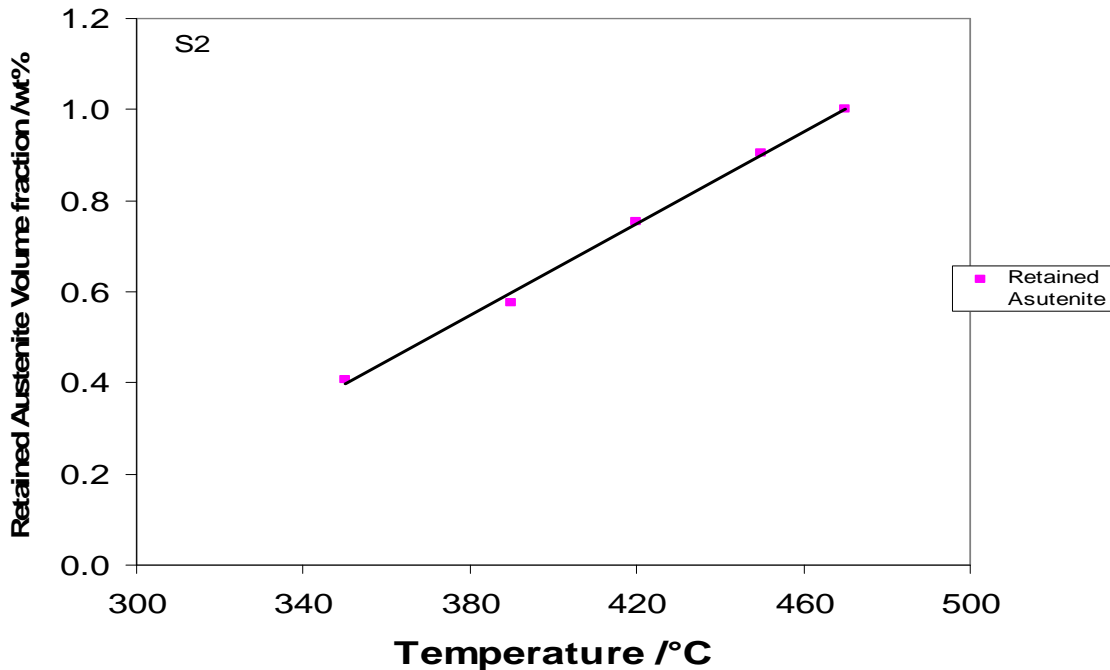
e : measured from dilatometric data

a_α & a_γ lattice constants are calculated at temperature T from lattice expansion coefficient.

V : volume fraction of bainitic ferrite.

S2

Retained austenite as a function of isothermal transformation temperature

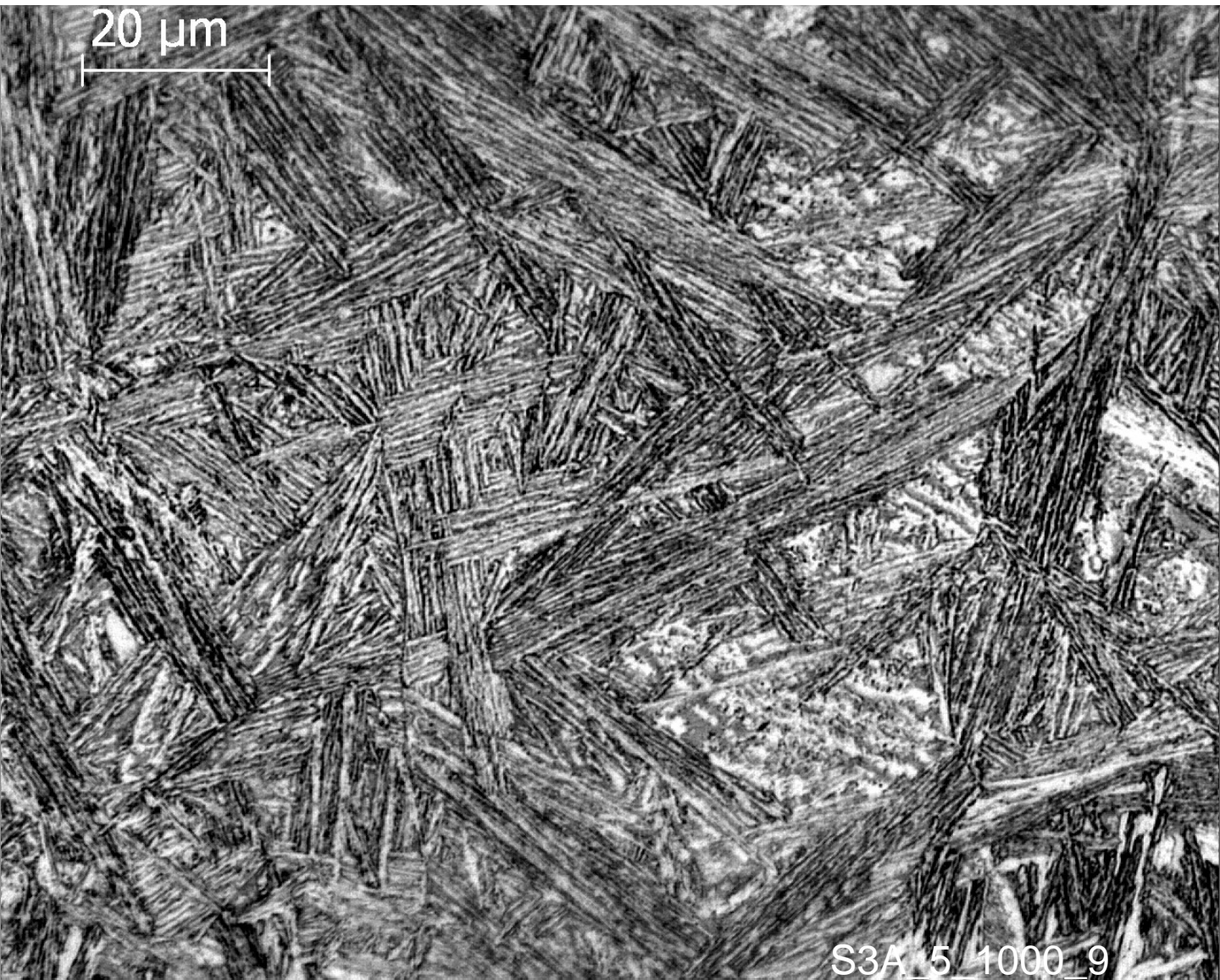


Retained austenite volume fraction = 1 - V

(Though this fraction at 450 & 470 °C includes contribution due to martensite that start forming as transformation temperature increases. So actual retained austenite at 450 & 470 °C is less than that is shown in this curve.)

Microstructure

360 °C



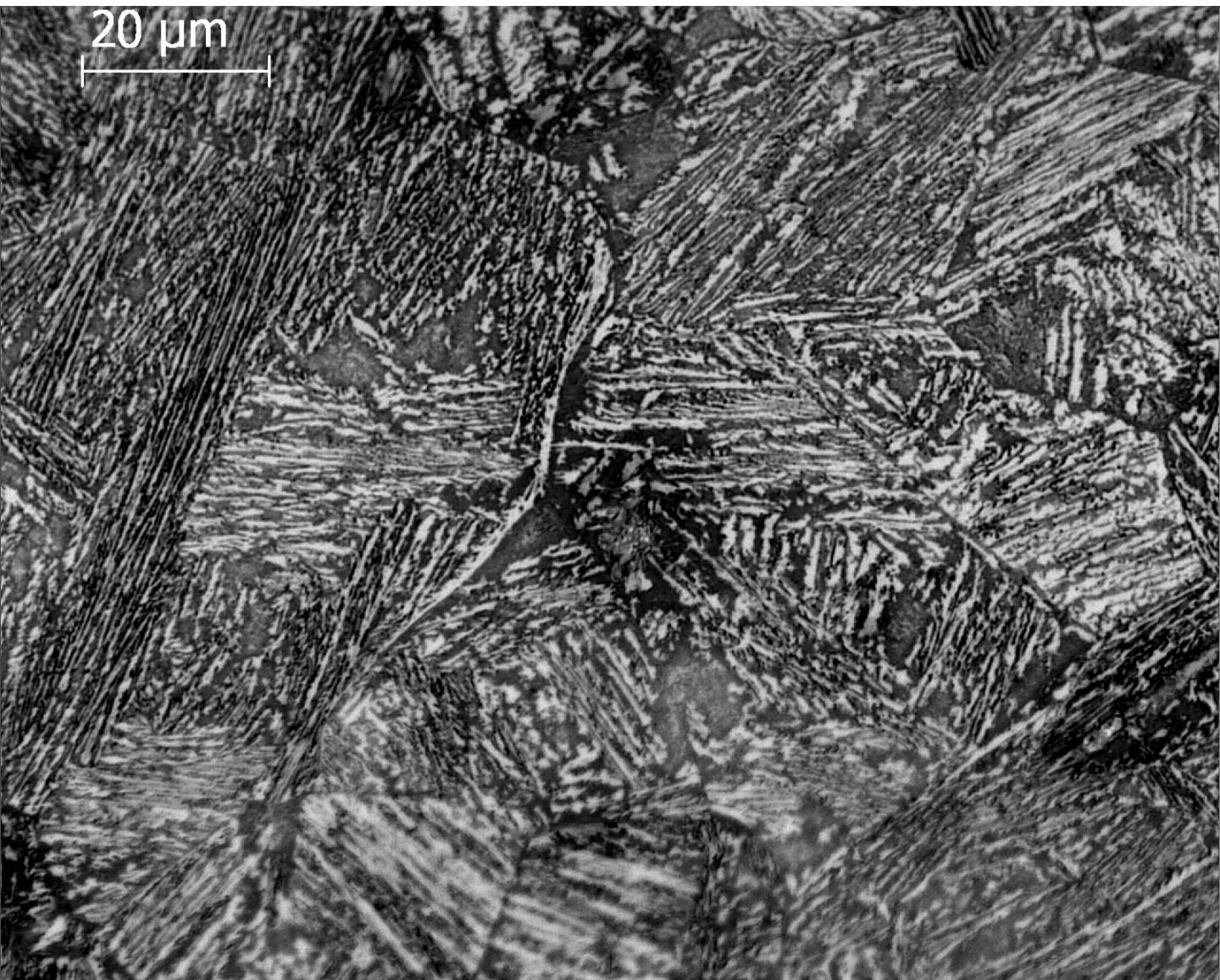
390 °C

20 μm



420 °C

20 μm



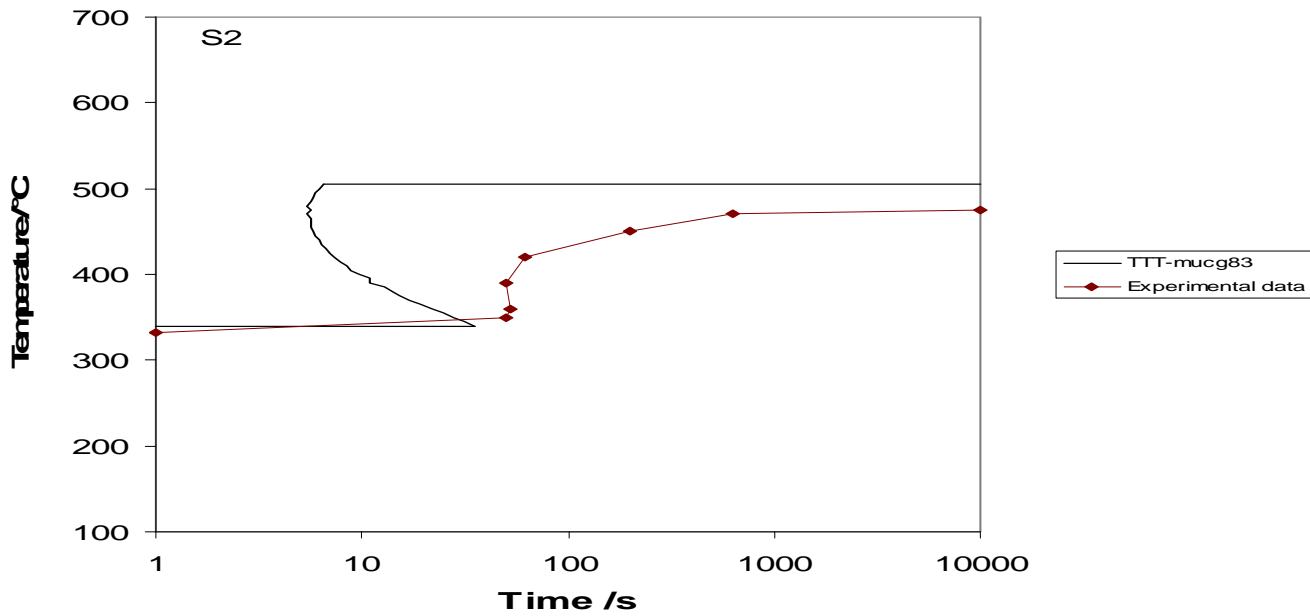
450 °C



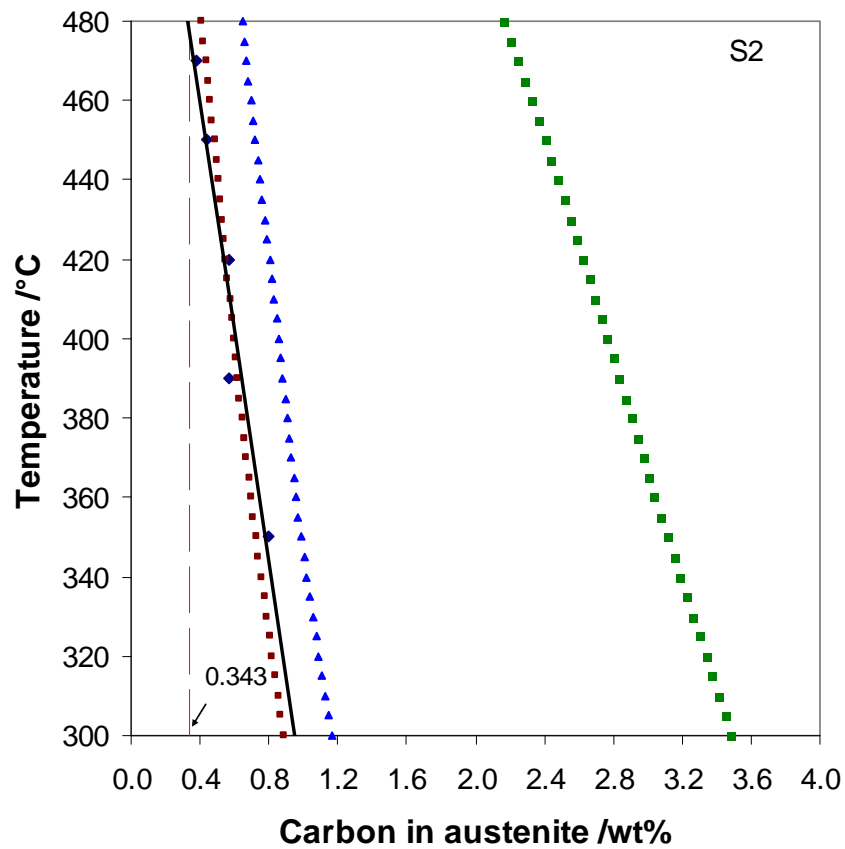
470 °C

20 μm





Lower C curve from calculation and experimental data



Carbon in austenite as T0' (experimental data) and T0, T0' and Ae3 (calculated)