The pyrolysis model in Morvan and Dupuy 2004 is

$$\frac{d}{dt}\alpha\rho = (\nu_{char} - \nu_{soot} - 1)\dot{\omega}_{pyr}\,, \tag{1}$$

where $\alpha\rho$ is the mass and the pyrolysis model is

$$\dot{\omega} = \frac{Q}{\delta h}\frac{T - 400}{100}\,. \tag{2}$$

$Q$ is the heat received by the solid fuel, that is:

$$\alpha\rho C\frac{dT}{dt} = Q\,. \tag{3}$$

The constant quantities are: $C$ specific heat of the material, $\delta h$ latent heat of pyrolysis $0.418 \times 10^6$, $\nu char, soot$ the stoichometric coefficents of the reactions.

Substituting equation (3) and (**??**) into equation (4) gives

$$\frac{d}{dt}\alpha\rho = (\nu_{char} - \nu_{soot} - 1)\frac{\alpha\rho C}{\delta h}\frac{T - 400}{100}\frac{dT}{dt}\,. \tag{4}$$

Changing variables from $t$ to $T$ gives

$$\frac{d}{dT}\alpha\rho = (\nu_{char} - \nu_{soot} - 1)\frac{\alpha\rho C}{\delta h}\frac{T - 400}{100}\,. \tag{5}$$

Then writing $M = \alpha\rho$ gives us an ode we can solve

$$\frac{d}{dT}M = (\nu_{char} - \nu_{soot} - 1)\frac{MC}{\delta h}\frac{T - 400}{100}\,, \tag{6}$$

$$M = M(0)\exp( \tag{7}$$

The other parameters are somewhat guessed. $C \approx 1900$ is guessed from data available on the internet. $\nu_{char} = 8/3$ Poitere, Morvan, et al. 1998 $\nu_{soot} = 1$ because it gives a nice fit.

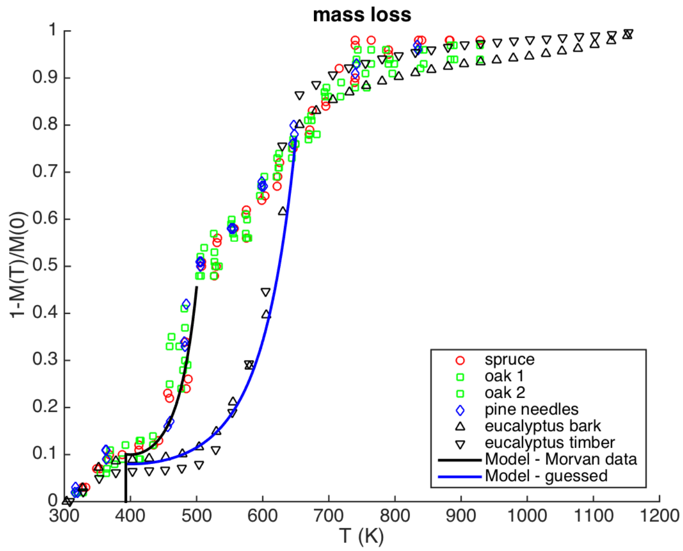


FIGURE 1. Dominique's and Rahul's TGA data with models