Module 2: Exercises: Consequences

Problem 1

Consequences of reaction runaway are usually significant.
Try to explain this by converting specific reaction energy (kJ/kg) into adiabatic temperature increase, kinetic energy and calculate the speed of 1 kg with similar energy, potential energy and calculate the height of 1 kg with similar energy and the quantity of methanol contained in the reaction mass that can be evaporated from 1 kg of reaction mass.
Please comment the values

	Heat of reaction 100 kJ/kg reaction mass	Heat of decomposition 2000 kJ/kg reaction mass
Adiabatic temperature rise c'p= 2 kJ/(kg·K)		
Mass of methanol to be evaporated per kg of reaction mass Heat of evaporation of methanol Q'_{vap} = 1100 kJ/kg MeOH		
Potential mechanic energy: height per kg of reaction mass		
Kinetic energy: achieved speed per kg of reaction mass		