

$$v_{(t)} = \frac{v_0 - \sqrt{\frac{g}{k}} \tanh(\sqrt{gk}t)}{1 - \sqrt{\frac{k}{g}} v_0 \tanh(\sqrt{gk}t)}$$

$$v_{\infty} = \sqrt{\frac{2mg}{\rho cs}}$$

$$k = \frac{1}{2} * \frac{\rho cs}{m}$$

$$v_{(t)} = \frac{v_0 - \sqrt{\frac{g}{\frac{1}{2} * \frac{\rho cs}{m}}} \tanh\left(\sqrt{g * \frac{1}{2} * \frac{\rho cs}{m}} * t\right)}{1 - \sqrt{\frac{\frac{1}{2} * \frac{\rho cs}{m}}{g}} v_0 \tanh\left(\sqrt{g * \frac{1}{2} * \frac{\rho cs}{m}} * t\right)}$$

$$// \frac{\frac{\rho cs}{2m}}{\frac{g}{1}} = \frac{\rho cs}{2mg}$$

$$v_{(t)} = \frac{v_0 - \sqrt{\frac{2mg}{\rho cs}} \tanh\left(\sqrt{\frac{g * \rho cs}{2m}} * \frac{g}{g} * t\right)}{1 - \sqrt{\frac{\rho cs}{2mg}} v_0 \tanh\left(\sqrt{\frac{g * \rho cs}{1m}} * \frac{g}{g} * t\right)}$$

$$v_{(t)} = \frac{v_0 - v_{\infty} \tanh\left(\frac{gt}{v_{\infty}}\right)}{1 - \frac{v_0}{v_{\infty}} \tanh\left(\frac{gt}{v_{\infty}}\right)}$$