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Topic: Thermodynamics 2, enthalpy problem.

Problem description: Finding enthalpy of water at 220°C and 0.01 Mpa.

Problem statement: Governing equation will be solved is  $y = (y_2 - y_1) / (x_2 - x_1) * (x - x_1) + y_1$

Numerical method: Intend to use interp1(pchip) to solve this problem

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clc;
clear;
close all;
Temperature=[50 100 150 200 250 300 400 500 600 700 800 900 1000 1100 1200 1300];
Enthalpy = [2592 2687.5 2783 2879.6 2977.5 3076.7 3280.0 3489.7 3706.3 3929.9 4160.6 4398.3 4642.8 4893.8 5150.8 5413.4];
plot(Temperature,Enthalpy,'ro','MarkerFaceColor',[1 1 1])
set(gca,'color',[0 0 0])

a=polyfit(Temperature,Enthalpy,1);
xx=linspace(0,1300);
yy=interp1(Temperature,Enthalpy,xx,"pchip");
hold on
plot(xx,yy)
legend('data points','shape preserving line','color',[1 1 1],'location','southoutside')
title('Saturated Vapor')
xlabel('Temperature(\circ C)')
ylabel('Enthalpy (kJ/kg)')
fprintf('Enthalpy at 220 C is %.4f',interp1(Temperature,Enthalpy,220,"pchip"))

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Enthalpy at 220 C is 2918.6038



