```matlab
%% getBandPropAlGaAs: function description
function [Ec, Eg, me_eff, mp_eff] = getBandPropAlGaAs(C_Al)
    n_Atoms = 4.42*1e28;
    n_Al = n_Atoms/2;
    x = C_Al./n_Al;

    more45 = double(x >= 0.45);
    more45Ec = 0.232*more45 - 0.259*more45.*x + 1.147*more45.*x.^2;
    more45Eg = 1.656*more45 + 0.215*more45.*x + 0.143*more45.*x.^2;

    less45 = double(x < 0.45);
    less45Ec = 0.773*less45.*x;
    less45Eg = 1.424*less45 + 1.247*less45.*x;

    Ec = less45Eg + more45Eg;
    Ec = Ec - min(Ec);

    Eg = more45Eg + less45Eg;

    me_eff = 0.067 + 0.083*x;
    mp_eff = 0.45*ones(size(x));
end
```