

### Highlights

- The CoNiGa ternary system is modeled thermodynamically using the CALPHAD approach in conjunction with ab-initio and available experimental data.
- Experiments were carried out on different compositions in the ternary system and measured properties were used to validate the thermodynamic model.
- The stability of the  $\beta$  phase has been accurately modeled by taking into account the low temperature stability of the  $\beta$  phase in the CoGa binary system