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Nd-Zn (Neodymium-Zinc)

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The Nd-Zn phase diagram in [Massalski2] was redrawn from [1972Mas].

Recently, this system was thermodynamically assessed by [2008Li], [2008Qi], and [2009Liu] independently. These assessments used the same experimental phase boundary data of [1972Mas] as the basis of their thermodynamic models. Accordingly the calculated phase diagrams were very similar except handling of the $NdZn_{11}$-$NdZn_{12}$ phase. According to [1972Mas], $NdZn_{12}$ is the high-temperature modification of $NdZn_{11}$, which has a solid solubility range of approximately 1 at.%. [2008Li] and [2009Liu] assumed only $NdZn_{11}$ exists as a line compound, whereas [2008Qi] assumed that $NdZn_{11}$ undergoes a polymorphic transformation at about 550 °C.

Figure 1 shows the Nd-Zn phase diagram taken from [2008Li] except the $NdZn_{11}$-$NdZn_{12}$ phase area. In this phase diagram, both $NdZn_{11}$ and $NdZn_{12}$ are shown as line compounds, but the peritectoidal formation temperature of $NdZn_{11}$ and the eutectoidal decomposition temperature of $NdZn_{12}$ are taken from [1972Mas]. Although this seems to be the most natural explanation of the existing experimental data, further confirmation is required.

References

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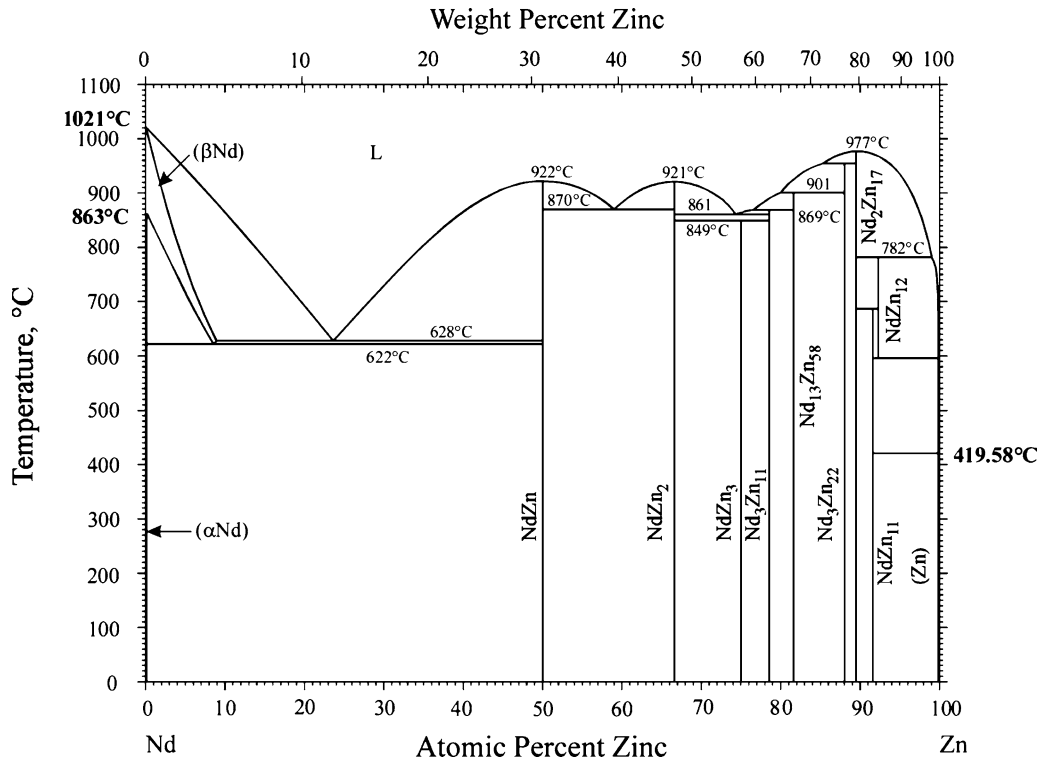

Fig. 1 Nd-Zn phase diagram