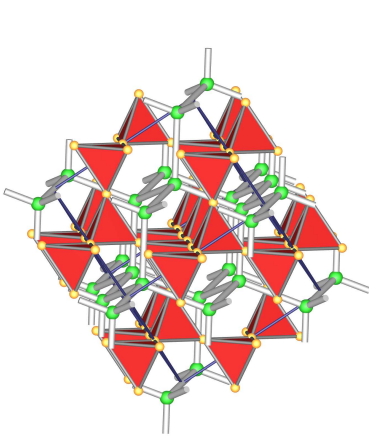
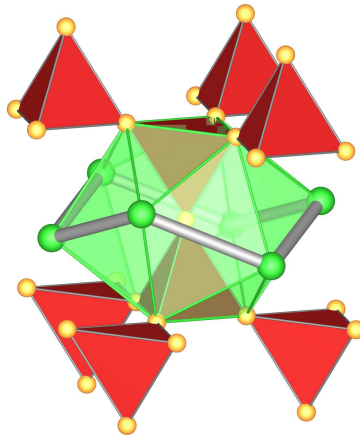


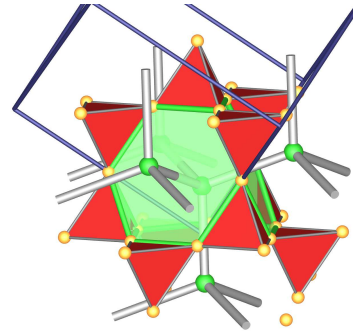
# Legierungen, intermetallische Phasen (Bsp. Ca – Cu – Sn) (Forts.)

## ③ Ca – Cu: Laves-Phasen usw.

### ① $\text{MgCu}_2$

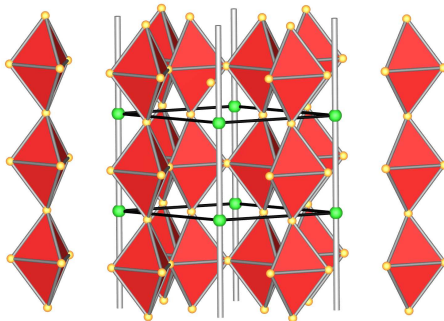
MgCu<sub>2</sub>: Gesamtstruktur

Cu: CN 6+6 (FK 12)

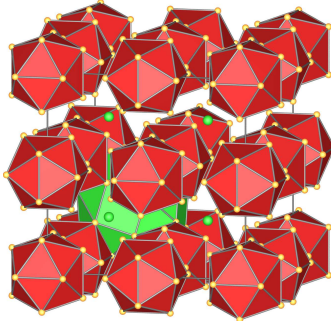
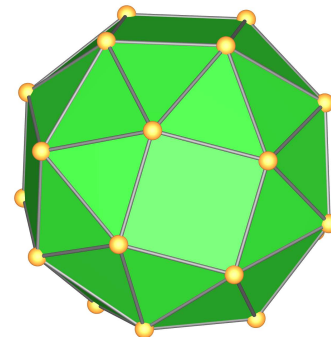


Mg: CN 12+4 (FK 16)

### ② $\text{CaCu}_5$

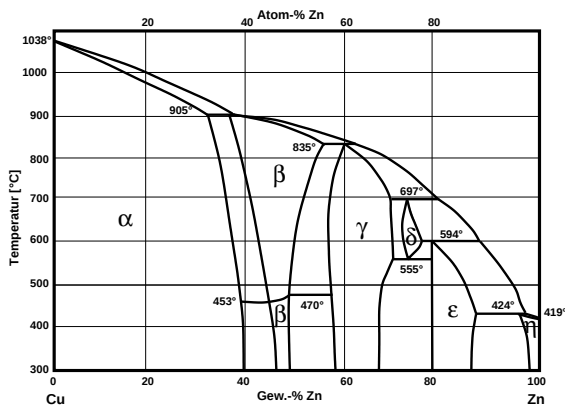
CaCu<sub>5</sub>-Typ

### ③ $\text{BaCu}_{13}$

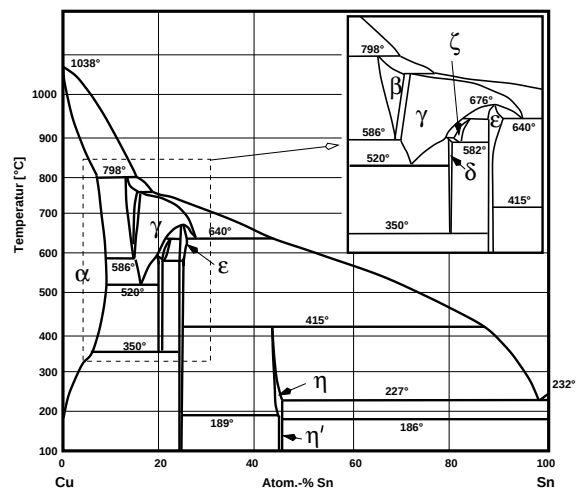
NaZn<sub>13</sub>-Typ

'Snub-Cube' als Na-CN

## ④ Cu – Sn: Hume-Rothery-Phasen



Phasendiagramm Cu-Zn (Messing)



Phasendiagramm Cu-Zn (Bronze)

|                       | $\alpha$ -Phase | $\beta$ -Phase                      | $\gamma$ -Phase                             | $\epsilon$ -Phase    |
|-----------------------|-----------------|-------------------------------------|---------------------------------------------|----------------------|
| Struktur              | fcc             | bcc                                 | kompl. kubisch (s.u.)                       | hcp                  |
| VEC (n. Hume-Rothery) | -               | $\frac{3}{2} = \frac{21}{14} = 1.5$ | $\frac{21}{13} = 1.615$                     | $\frac{7}{4} = 1.75$ |
| Maximale Löslichkeit  | 1.362           | 1.48                                | 1.538                                       |                      |
| Experimentelle Werte  |                 |                                     |                                             |                      |
| Cu-Zn                 | 1.284           | CuZn (1.48)                         | Cu <sub>5</sub> Zn <sub>8</sub> (1.58-1.66) | CuZn <sub>3</sub>    |
| Cu-Sn                 | 1.270           | Cu <sub>5</sub> Sn (1.49)           | Cu <sub>31</sub> Sn <sub>8</sub> (1.67)     | Cu <sub>3</sub> Sn   |
| Cu-Al                 | 1.408           | Cu <sub>3</sub> Al (1.48)           | Cu <sub>9</sub> Al <sub>4</sub> (1.62-1.77) | -                    |
| Co-Zn                 |                 | CoZn <sub>3</sub>                   | Co <sub>5</sub> Zn <sub>21</sub>            | -                    |
| Cu-In                 |                 | Cu <sub>3</sub> In                  | Cu <sub>9</sub> In <sub>4</sub>             | -                    |

Valenzelektronenkonzentrationen (VEC) und Strukturchemie