This data article presents the compilation of mechanical properties for 370 high entropy alloys (HEAs) and complex concentrated alloys (CCAs) reported in the period from 2004 to 2016. The data sheet includes alloy composition, type of microstructures, density, hardness, type of tests to measure the room temperature mechanical properties, yield strength, elongation, ultimate strength and Young’s modulus. For 27 refractory HEAs (RHEAs), the yield stress and elongation are given as a function of the testing temperature. The data are stored in a database provided in Supplementary materials, and for practical use they are tabulated in the present paper. The database was used in recent publications by Miracle and Senkov [1], Gorsse et al. [2] and Senkov et al. [3].

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**Experimental factors**  
Data compilation from available literature. Data sheet contains about 81 references.

**Experimental features**  
Extensive Data compilation. Alloys’ densities and Young’s modulus were computed using the rule of mixtures (ROM) for the different reported alloy compositions.

**Data source location**  
Data are with the article

**Data accessibility**  
Direct submission. Most relevant research article: S. Gorsse, D.B. Miracle, O.N. Senkov, Mapping the world of complex concentrated alloys, Acta Materialia 135 (2017) 177–187 [2].

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### Value of the data

- The database covers the main mechanical properties of HEAs and CCAs tested under uniaxial loading from published reports since 2004 until end of 2016.
- The database can be used to assess the potential of HEAs and CCAs as possible structural materials.
- The database can be used to represent various property spaces and calculate performance indices.
- The database can enable data mining to extract insights and uncover patterns to guide and accelerate the development of HEAs and CCAs.

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### 1. Data

High entropy alloys (HEAs) and complex concentrated alloys (CCAs) represent a new branch of the metallic alloy tree. HEAs are defined as alloys with 5 or more principal elements that have concentrations between 5 and 35 atom percent, promoting the formation of single-phase-disordered solid solutions presumably stabilized by the configurational entropy of mixing. CCAs encompass all alloys, including HEAs, with three or more principal components. CCAs can have single-phase or multi-phase microstructure.

A detailed comparison of CCAs with competing commercial alloys is crucial to identify the most attractive alloys for structural applications and guide future studies [1-3]. The relative merits of these new alloys depend on combinations of properties specific to the applications and loading conditions. Thus, this data article is a compilation of the density and mechanical properties of CCAs published in the literature since 2004, allowing the performance indices for lighter, stronger and stiffer structures to be evaluated for different loading conditions [2]. The data are stored in a database and tabulated in the present article.

### 2. Experimental design, materials and methods

The database has a tree-like classification (Fig. 1) which includes four different families: 3d transition metal (3d TM), refractory metal (RHEAs and RCCAs), light metal family, and bronzes and brasses HEAs/CCAs. Each family is expanded in classes (a class is a unique combination of principal elements), and each class contains members having variations in principal element concentrations. Each member is characterized by a set of attributes which includes: alloy composition, phase content, density, hardness (Vickers), type of mechanical test (tension or compression), yield strength, ultimate strength, elongation, and Young’s modulus. A listing of these entries makes up a material record. The database was used by Gorsse et al. [2] with Cambridge Education Software (CES) enabling users to (i) browse the materials data, (ii) search and filter to narrow down the set of materials using given parameters (e.g. alloy composition that contains a specific chemical element), (iii) represent material property maps by plotting any properties or combination of properties against any other property, and (iv) select materials using performance indices as defined by M. F. Ashby.

A representation of the data is illustrated in Fig. 2 where the room temperature yield strength is plotted against the density for CCAs.
Since this work reflects the state of the art of the field of HEAs and CCAs, the properties are not equally populated for every alloy due to the lack of literature data. The density of the alloy was estimated using the rule of mixtures (ROM): $\rho = \sum x_i M_i / \sum x_i V_i$ where $x_i$, $M_i$ and $V_i$ are the atomic fraction, molar mass and molar volume of the element $i$. When not experimentally measured, the Young’s modulus was estimated using ROM for single phase solid solutions only: $E = \sum x_i E_i$ where $E_i$ is the Young modulus of the alloy element $i$.

For practical use by all, the data are also given in the present article using Tables and shared on Google Drive via the following link: https://docs.google.com/spreadsheets/d/1hLiqmlysSKK7Ubv362v8 fasoh8-W17V7zqNzR5oilw/edit?usp=sharing. The main entries for 370 alloy compositions are listed at room temperature in Table 1, while Table 2 shows the temperature dependence of the mechanical properties for 27 HEAs/CCAs. Each row in Table 1 corresponds to one mechanical test for an alloy composition in an experimentally characterized metallurgical condition.

**Fig. 1.** Tree-like classification of the HEAs/CCAs database.

**Fig. 2.** Materials property space for room temperature yield strength vs density of HEAs and CCAs. Alloy members have been colored to identify crystal structure (Im stands for intermetallic). The lines give performance index for uniaxial loading (corresponding to the material index $\sigma’/\rho$ where $\sigma’$ and $\rho$ are the yield strength and the density, respectively).
Table 1
HEAs and CCAs for which mechanical tests are reported in literature. $\rho$ represents the density, HV is the hardness in Vickers, $\sigma^\text{Y}$ is the Yield strength, $\sigma^\text{max}$ is the ultimate strength, $\varepsilon$ is the elongation and $E$ is the Young’s modulus. Parentheses indicate values estimated using ROM. In the column “Type of tests”, C and T stands for compression and tension. Im stands for Intermetallic. Each row represents the result of a test on a specific alloy composition.

| Composition (atomic) | Ref. | Type of phases | $\rho$ (g/cm$^3$) | HV | Type of tests $\sigma^\text{Y}$ (MPa) | $\sigma^\text{max}$ (MPa) | $\varepsilon$ (%) | $E$ (GPa) |
|----------------------|------|----------------|-------------------|----|----------------------|----------------------|----------------|----------|
| CoFeNi [4]           |      | FCC            | (8.5)             | 125 | C                    | 204                  | | (207)     |
| CoFeNi [4]           |      | FCC            | (8.5)             | 125 | C                    | 209                  | | (207)     |
| CoFeNi [5]           |      | FCC            | (8.5)             |     | T                    | 211                  | 513            | 31        | (207)    |
| CoFeNi0.25 [4]       |      | FCC            | (7.7)             | 149 | C                    | 196                  | | (194)     |
| CoFeNi0.5 [4]        |      | FCC            | (7.1)             | 287 | C                    | 476                  | |           |
| CoFeNi0.75 [4]       |      | FCC            | (6.6)             | 570 | C                    | 1301                 | |           |
| A10.25CoFeNi [4]     |      | FCC            | (7.9)             | 138 | C                    | 158                  | | (196)     |
| A10.5CoFeNi [4]      |      | FCC + BCC      | (7.4)             | 212 | C                    | 346                  | | (187)     |
| A10.75CoFeNi [4]     |      | FCC + BCC      | (7.0)             | 385 | C                    | 794                  | | (179)     |
| CoCrFeNi [6]         |      | FCC            | (8.2)             |     | T                    | 148                  | 413            | 48        | (225)    |
| CoCrFeNi [7]         |      | FCC            | (8.2)             | 116 | C                    |                     | | (225)     |
| CoCrFeNi [7]         |      | FCC            | (8.2)             | 113 | C                    |                     | | (225)     |
| CoCrFeMo0.5Ni [8]    |      | FCC + Im       | (8.5)             |     | C                    | 210                  | |           |
| CoCrFeNb0.103Ni [6]  |      | FCC + Im       | (8.2)             |     | T                    | 318                  | 622            | 19        |         |
| CoCrFeNb0.155Ni [6]  |      | FCC + Im       | (8.2)             |     | T                    | 322                  | 744            | 23        |         |
| CoCrFeNb0.206Ni [6]  |      | FCC + Im       | (8.2)             |     | T                    | 403                  | 807            | 9         |         |
| CoCrFeNb0.309Ni [6]  |      | FCC + Im       | (8.2)             |     | T                    | 479                  | 879            | 4         |         |
| CoCrFeNb0.412Ni [6]  |      | FCC + Im       | (8.2)             |     | T                    | 638                  | 1004           | 1         |         |
| CoCrFeNiTi [9]       |      | FCC            | (7.2)             |     | C                    | 2020                 | 9              | 135      | (203)    |
| Co1.5CrFeNi1.5Ti0.5  |      | FCC            | (7.8)             | 509 | C                    |                     | | (211)     |
| Co1.5CrFeNi1.5Ti     |      | FCC + Im       | (7.4)             |     | 654                  |                     | |           |
| A10.25CoCrFeNi [7]   |      | FCC            | (7.7)             | 110 | C                    |                     | | (216)     |
| A10.25CoCrFeNi [7]   |      | FCC            | (7.7)             | 113 | C                    |                     | | (216)     |
| A10.375CoCrFeNi [7]  |      | FCC            | (7.5)             | 131 | C                    |                     | | (211)     |
| A10.375CoCrFeNi [7]  |      | FCC            | (7.5)             | 196 | C                    |                     | | (211)     |
| A10.5CoCrFeNi [7]    |      | FCC + BCC      | (7.3)             | 159 | C                    |                     | | (208)     |
| A10.5CoCrFeNi [7]    |      | FCC + BCC      | (7.3)             | 209 | C                    |                     | | (208)     |
| A10.7Co0.3CrFeNi [11]|      | FCC + BCC + B2 | (6.8)             | 624 | C                    | 2033                 | 2635           | 8         |         |
| A10.75CoCrFeNi [7]   |      | FCC + BCC      | (7.0)             | 388 | C                    |                     | | (200)     |
| A10.75CoCrFeNi [7]   |      | FCC + BCC      | (7.0)             | 280 | C                    |                     | | (200)     |
| A10.875CoCrFeNi [12] |      | FCC + BCC      | (6.9)             | 538 | C                    |                     | | (197)     |
| A10.875CoCrFeNi [7]  |      | FCC + BCC      | (6.9)             | 361 | C                    |                     | | (197)     |
| AlCoCrFeNi [7]       |      | FCC + BCC      | (6.7)             | 484 | C                    |                     | | (194)     |
| AlCoCrFeNi [7]       |      | FCC + BCC      | (6.7)             | 433 | C                    |                     | | (194)     |
| AlCoCrFeNi [13]      |      | FCC            | (6.7)             | 395 | C                    |                     | | (194)     |
| AlCoCrFeNi [14]      |      | FCC            | (6.7)             | 395 | C                    |                     | | (194)     |
| AlCoCrFeNi [15]      |      | FCC            | (6.7)             | 1051| C                    |                     | | (194)     |
| AlCoCrFeNi [16]      |      | FCC            | (6.7)             | 1110| C                    |                     | | (194)     |
| AlCoCrFeNi [17]      |      | FCC            | (6.7)             | 1138| C                    |                     | | 125       | (194)    |
| AlCoCrFeNi [18]      |      | FCC            | (6.7)             | 1138| C                    |                     | | 112       | (194)    |
| AlCoCrFeNi [19]      |      | FCC            | (6.7)             | 1051| C                    |                     | | (194)     |
| AlCoCrFeNi [20]      |      | FCC            | (6.7)             | 520 | C                    | 1373                 | 3531           | 25        | (194)    |
| Al1.25CoCrFeNi [7]   |      | FCC            | (6.5)             | 487 | C                    |                     | | (188)     |
| Al1.25CoCrFeNi [7]   |      | FCC            | (6.5)             | 499 | C                    |                     | | (188)     |
| Al1.5CoCrFeNi [7]    |      | FCC            | (6.2)             | 484 | C                    |                     | | (183)     |
| Al1.5CoCrFeNi [7]    |      | FCC            | (6.2)             | 517 | C                    |                     | | (183)     |
| Al1.5CoCrFeNi [13]   |      | FCC            | (6.2)             | 402 | C                    |                     | | (183)     |
| Al2CoCrFeNi [7]      |      | FCC            | (5.9)             | 509 | C                    |                     | | (173)     |
| Al2CoCrFeNi [7]      |      | FCC            | (5.9)             | 512 | C                    |                     | | (173)     |
| Al2CoCrFeNi [13]     |      | FCC            | (5.9)             | 432 | C                    |                     | | (173)     |
| Al2.5CoCrFeNi [13]   |      | FCC            | (5.6)             | 487 | C                    |                     | | (165)     |
| Al3CoCrFeNi [13]     |      | FCC            | (5.3)             | 506 | C                    |                     | | (158)     |
| Al0.1CoCrFeNi [18]   |      | FCC + Im       | (6.7)             | C   | 957                  | 2550                 | 11             | 213       |
| Al0.2CoCrFeNi [18]   |      | FCC + Im       | (6.8)             | C   | 906                  | 2386                 | 9              | 151       |
| Composition (atomic) | Ref. | Type of phases | $\rho$ (g/cm³) | HV Type of tests | $\sigma^\prime$ (MPa) | $\sigma_{\text{max}}$ (MPa) | $\epsilon$ (%) | $E$ (GPa) |
|---------------------|------|----------------|----------------|------------------|---------------------|------------------|-------------|----------|
| Al0.3CoCrFeNi[18]  | BCC + Im | (6.8) | C | 867 | 2178 | 8 | 137 |
| Al0.4CoCrFeNi[18]  | BCC + Im | (6.8) | C | 1056 | 2375 | 7 | 156 |
| Al0.5CoCrFeNi[18]  | BCC + Im | (6.8) | C | 1060 | 2250 | 6 | 181 |
| AlCoCrFeNi[18]     | BCC + Im | (6.9) | C | 1251 | 2166 | 7 | 75 |
| AlCoFeNi[18]       | BCC + Im | (7.0) | C | 1255 | 2083 | 6 | 73 |
| AlCoFe0.6Ni[23]    | BCC + Im | (7.1) | C | 1804 | 2280 | 9 | (196) |
| AlCoFe0.1Ni[19]    | BCC | (6.8) | C | 1804 | 2280 | 9 | (196) |
| AlCoFe0.2Ni[19]    | BCC + Im | (6.9) | C | 2456 | 2953 | 3 | |
| AlCoFe0.3Ni[19]    | BCC + Im | (7.0) | C | 2649 | 3208 | 3 | |
| AlCoFe0.4Ni[19]    | BCC + Im | (7.0) | C | 2670 | 3161 | 3 | |
| AlCoFe0.5Ni0.5[23] | BCC + Im | (7.0) | C | 708 |
| AlCoFe0.5Ni[21]    | BCC + Im | (7.1) | C | 2757 | 3036 | 3 | |
| AlCoFe0.5Ni[8]     | BCC + Im | (7.1) | C | 796 |
| AlCoFe0.5Ni[23]    | BCC + Im | (7.1) | C | 730 |
| AlCoFe0.5Ni1.5[23] | FCC + BCC + Im | (7.2) | | 586 |
| AlCoFe0.5Ni2[23]   | FCC + BCC + Im | (7.4) | | 395 |
| AlCoFeNi0.5[21]    | BCC + Im | (7.2) | | 741 |
| AlCoFeNi0.5[21]    | FCC + BCC + Im | (7.3) | | 586 |
| AlCoFeNi1.5[21]    | BCC + Im | (7.2) | | 635 |
| AlCoFeNi2[22]      | BCC + Im | (7.2) | | 639 |
| AlCoFeNi0.5Ni[8]   | BCC + Im | (6.6) | | 655 |
| AlCoFeNi0.5Ni[24]  | BCC | (6.3) | | 605 |
| AlCoFeNi0.1Ni[20]  | BCC | (6.8) | 569 | 3285 | 17 | (192) |
| AlCoFeNi0.25Ni[20] | BCC + Im | (6.8) | 668 | 3008 | 11 | |
| AlCoFeNi0.5Ni[20]  | BCC + Im | (7.0) | 747 | 3170 | 4 | |
| AlCoFeNi0.75Ni[20] | BCC + Im | (7.0) | | |
| AlCoFeNi0.2[24]    | BCC | (6.5) | C | 1265 | 2173 | 14 | (188) |
| AlCoFeNi0.4[24]    | BCC | (6.2) | C | 1481 | 2444 | 13 | (183) |
| AlCoFeNi0.6[24]    | BCC | (6.0) | C | 1834 | 2195 | 3 | (178) |
| AlCoFeNi0.8[24]    | BCC + Im | (5.8) | C | 2179 | 2664 | 2 | |
| AlCoFeNi[24]       | BCC | (5.7) | | 110 |
| AlCoFeNi[24]       | BCC + Im | (5.7) | C | 2411 | 2950 | 1 | |
| A1.1CoFeNi0.5[10]  | FCC | (7.6) | | 487 |
| A1.1CoFeNi1.5Ti0.5 | FCC + Im | (7.2) | | 717 |
| A1.1CoFeNiTi[9]    | BCC + Im | (6.6) | C | 1600 | 10 | 107 |
| A1.1CoFeNiTi0.5[25] | FCC | (6.4) | 178 | 3135 | 24 | 72 | (187) |
| A1.1CoFeNiTi0.6[25] | FCC | (6.4) | 178 | 3240 | 23 | 78 | (187) |
| A1.1CoFeNiTi[26]   | BCC | (6.2) | C | 1860 | 2580 | 9 | 90 | (181) |
| A1.1CoFeNiTi[9]    | BCC + Im | (6.2) | C | 2280 | 6 | 148 |
| A1.1CoFeNiTi1.5[26] | BCC + Im | (6.1) | C | 2220 | 2720 | 5 | 160 |
| A1.1CoFeNiTi[9]    | BCC | (5.9) | C | 2110 | 10 | 133 | (172) |
| Al2CoFeNiTI[9]     | BCC | (5.6) | 643 | 1030 | 5 | 94 | (165) |
| Al2CoFeNiTiVZr[27] | BCC | (6.3) | 780 |
| CoFeMnNi[28]       | FCC | (8.0) | 176 | T | 208 | 62 | (219) |
| CoFeMnNi[29]       | FCC | (8.0) | 144 | C | 230 | 75 | (219) |
| CoFeMnNi0.25[29]   | FCC | (7.9) | 151 | C | 200 | 75 | (219) |
| CoFeMnNi0.5[29]    | FCC | (7.8) | 186 | C | 620 | 75 | (211) |
| CoFeMnNi0.75[29]   | FCC + Im | (7.7) | 342 | C | 740 | 1325 | 8 |
| CoFeMnNi1.0[29]    | FCC + Im | (7.7) | 650 | C | 1660 | 1845 | < 1 |
| A1.10CoFeMnNi[28]  | FCC | (7.9) | | 80 |
| A1.20CoFeMnNi[28]  | FCC | (7.7) | 171 | T | 220 | 56 | (214) |
| A1.38CoFeMnNi[28]  | FCC | (7.5) | 182 | T | 244 | 45 | (209) |
| A1.43CoFeMnNi[28]  | FCC + BCC | (7.4) | 183 | T | 285 | 35 | (208) |
| A1.49CoFeMnNi[28]  | FCC + BCC | (7.4) | 220 | T | 331 | 29 | (206) |
| A1.56CoFeMnNi[28]  | FCC + BCC | (7.3) | 278 | T | 526 | 16 | (204) |
| A1.62CoFeMnNi[28]  | FCC + BCC | (7.2) | 405 | T | 833 | 5 | (203) |
| Composition (atomic) | Ref. | Type of phases | $\rho$ (g/cm$^3$) | HV Type of tests | $\sigma^y$ (MPa) | $\sigma^\text{max}$ (MPa) | $\epsilon$ (%) | $E$ (GPa) |
|---------------------|------|----------------|------------------|----------------|------------------|------------------|---------------|----------|
| Al0.68CoCrFeMnNi    | [28] | FCC + BCC      | (7.2)            | 486            | (202)            |                  |               |          |
| Al0.75CoCrFeMnNi    | [28] | FCC + BCC      | (7.1)            | 530            | (200)            |                  |               |          |
| Al0.81CoCrFeMnNi    | [28] | FCC + BCC      | (7.0)            | 539            | (199)            |                  |               |          |
| Al0.88CoCrFeMnNi    | [28] | FCC + BCC      | (7.0)            | 533            | (197)            |                  |               |          |
| Al0.95CoCrFeMnNi    | [28] | FCC + BCC      | (6.9)            | 535            | (196)            |                  |               |          |
| Al1.25CoCrFeMnNi    | [28] | BCC             | (6.6)            | 539            | (190)            |                  |               |          |
| CoCrNi              | [5]  | FCC             | (8.3)            | 300            | 860              | 60               | 229           |          |
| CoMnNi              | [5]  | FCC             | (8.4)            | 231            | 653              | 38               | 202           |          |
| FeMnNi              | [5]  | FCC             | (8.1)            | 221            | 602              | 36               | 203           |          |
| CoCrFeNi            | [5]  | FCC             | (8.2)            | 274            | 708              | 39               | 225           |          |
| CoCrMnNi            | [5]  | FCC             | (8.1)            | 282            | 694              | 44               | 222           |          |
| CoFeMnNi            | [5]  | FCC             | (8.2)            | 170            | 550              | 41               | 205           |          |
| Al0.5CrFe1.5MnNi0.5 | [30] | BCC             | (7.0)            | 396            |                  |                  |               |          |
| Al0.3CoCrCuFeNi     | [32] | FCC             | (7.7)            | 180            |                  |                  |               |          |
| Al0.5CoCrCuFeNi     | [32] | FCC             | (7.4)            | 207            |                  |                  |               |          |
| Al0.8CoCrCuFeNi     | [32] | FCC             | (7.0)            | 271            |                  |                  |               |          |
| Al1.3CoCrCuFeNi     | [32] | FCC             | (6.8)            | 407            |                  |                  |               |          |
| Al1.5CoCrCuFeNi     | [32] | FCC             | (6.5)            | 476            |                  |                  |               |          |
| Al1.8CoCrCuFeNi     | [32] | FCC + BCC       | (6.0)            | 557            |                  |                  |               |          |
| Al2.0CoCrCuFeNi     | [32] | FCC + BCC       | (5.9)            | 567            |                  |                  |               |          |
| Al2.3CoCrCuFeNi     | [32] | FCC + BCC       | (5.7)            | 603            |                  |                  |               |          |
| Al2.5CoCrCuFeNi     | [32] | FCC + BCC       | (5.6)            | 624            |                  |                  |               |          |
| Al2.8CoCrCuFeNi     | [32] | BCC             | (5.5)            | 657            |                  |                  |               |          |
| Al3.0CoCrCuFeNi     | [32] | BCC             | (5.4)            | 644            |                  |                  |               |          |
| CoCrCuFeNiO.5Ni     | [33] | FCC             | (8.3)            | 172            |                  |                  |               |          |
| CoCrCuFeNiO.5Co     | [34] | FCC             | (8.3)            | 132 C          | 230              |                  | 56 (206)     |
| CoCrCuFeNiO.5Al     | [45] | FCC             | (8.3)            | 286 C          | 230              | 888             | 51 (206)     |
| CoCrCuFeNiO.5Co     | [13] | FCC             | (8.3)            | 286 C          |                  |                  |               |          |
| CoCrCuFeNiO.5Co     | [34] | FCC             | (7.8)            | 1650           | 29               | 93 (198)       |
| CoCrCuFeNiO.5Co     | [35] | FCC             | (7.8)            | 1650           | 22               | 99 (198)       |
| CoCrCuFeNiO.5Co     | [35] | FCC + Im        | (7.6)            | 1848           | 3               | 128            |
| CoCrCuFeNiO.5Co     | [35] | FCC             | (7.4)            | 1272           | 2               | 77 (191)      |
| Al0.25CoCrCu0.5FeNi | [25] | FCC             | (7.5)            | 750            | 1970            | 39              | 103 (195)    |
| Al0.25CoCrCu0.75FeNi| [25] | FCC             | (7.5)            | 1970           | 39              | 103 (195)    |
| Al0.3CoCrCuFeNi     | [34] | FCC             | (7.9)            | 180            |                  |                  |               |          |
| Al0.5CoCrCuFeNi     | [34] | FCC             | (7.6)            | 210 C          |                  |                  |               |          |
| Al0.5CoCrCuFeNi     | [34] | FCC             | (7.6)            | 300            |                  |                  |               |          |
| Al0.5CoCrCuFeNi     | [37] | FCC             | (7.6)            | 225            |                  |                  |               |          |
| Al0.5CoCrCuFeNi     | [38] | FCC             | (7.6)            | 215            |                  |                  |               |          |
| Al0.8CoCrCuFeNi     | [21] | FCC + BCC       | (7.3)            | 270            |                  |                  |               |          |
| Al0.8CoCrCuFeNi     | [34] | FCC             | (7.3)            | 270            |                  |                  |               |          |
| Al0.8CoCrCuFeNi     | [34] | FCC + BCC       | (7.1)            | 406 C          |                  |                  |               |          |
| Al0.8CoCrCuFeNi     | [39] | FCC + BCC       | (7.1)            | 406 C          |                  |                  |               |          |
| Al0.8CoCrCuFeNi     | [40] | FCC + BCC + Im  | (7.1)            | 1005           | 15              |                  |               |          |
| Al0.8CoCrCuFeNi     | [40] | FCC + BCC + Im  | (6.6)            | 1234           | 9               | 174            |
| Al0.8CoCrCuFeNi     | [40] | FCC + BCC + Im  | (6.9)            | 1469           | 16              | 175            |
| Al1.3CoCrCuFeNi     | [34] | FCC + BCC       | (6.8)            | 470            |                  |                  |               |          |
| Al1.5CoCrCuFeNi     | [34] | FCC + BCC       | (6.8)            | 506            |                  |                  |               |          |
| Al1.8CoCrCuFeNi     | [34] | FCC + BCC       | (6.4)            | 650            |                  |                  |               |          |

3d TM HEAS and CCAs in the Al-Co-Cr-Cu-Fe-Mn-Ni system and derivates

CoCrCuFe

CoCrCuFeNi

CoCrCuFeNiO.5
| Composition (atomic) | Ref. | Type of phases     | $\rho$ (g/cm³) | HV | Type of tests | $\sigma^\rho$ (MPa) | $\sigma_{max}$ (MPa) | $\epsilon$ (%) | $E$ (GPa) |
|---------------------|------|-------------------|----------------|----|--------------|-------------------|------------------|---------------|----------|
| Al2CoCrCuFeNi      | [34] | FCC + BCC         | (6.3)          | 560| C            | 1620             |                  |               |           |
| Al2.3CoCrCuFeNi    | [34] | FCC + BCC         | (6.1)          | 600|              |                  |                  |               |           |
| Al2.5CoCrCuFeNi    | [34] | FCC + BCC         | (6.0)          | 620|              |                  |                  |               |           |
| Al2.8CoCrCuFeNi    | [34] | BCC               | (3.8)          | 650|              |                  |                  |               |           |
| Al3CoCrCuFeNi      | [41] | BCC               | (3.7)          | 640|              |                  |                  |               |           |
| Al0.5B0.2CoCrCuFeNi| [36] | FCC + BCC         | (7.7)          | 415|              |                  |                  |               |           |
| Al0.5B0.6CoCrCuFeNi| [36] | FCC + BCC         | (7.7)          | 505|              |                  |                  |               |           |
| Al0.5CoCrCuFeNi    | [36] | FCC + BCC         | (7.8)          | 736|              |                  |                  |               |           |
| A0.5CoCrCu0.5FeNiTi0.5| [25] | FCC + BCC         | (7.1)          | 1580| 2389         | 17               | 161(192)        |               |           |
| A0.5CoCrCuFeNiTi0.2 | [37] | FCC               | (7.5)          | 272|              |                  |                  |               |           |
| A0.5CoCrCuFeNiTi0.4 | [37] | FCC               | (7.3)          | 321|              |                  |                  |               |           |
| A0.5CoCrCuFeNiTi0.6 | [37] | FCC + BCC         | (7.2)          | 458|              |                  |                  |               |           |
| A0.5CoCrCuFeNiTi0.8 | [37] | FCC + BCC         | (7.1)          | 590|              |                  |                  |               |           |
| A0.5CoCrCuFeNiTi1.2 | [37] | FCC + BCC + Im    | (7.0)          | 636|              |                  |                  |               |           |
| A0.5CoCrCuFeNiTi1.4 | [37] | FCC + BCC + Im    | (6.9)          | 646|              |                  |                  |               |           |
| A0.5CoCrCuFeNiTi1.6 | [37] | FCC + BCC + Im    | (6.8)          | 664|              |                  |                  |               |           |
| A0.5CoCrCuFeNiTi1.8 | [37] | FCC + BCC + Im    | (6.6)          | 667|              |                  |                  |               |           |
| A0.5CoCrCuFeNiTi2  | [37] | FCC + BCC + Im    | (6.5)          | 696|              |                  |                  |               |           |
| A0.5CoCrCuFeNiV0.2 | [38] | FCC               | (7.6)          | 204|              |                  |                  |               |           |
| A0.5CoCrCuFeNiV0.4 | [38] | FCC + BCC         | (7.5)          | 231|              |                  |                  |               |           |
| A0.5CoCrCuFeNiV0.6 | [38] | FCC + BCC + Im    | (7.5)          | 328|              |                  |                  |               |           |
| A0.5CoCrCuFeNiV0.8 | [38] | FCC + BCC + Im    | (7.4)          | 447|              |                  |                  |               |           |
| A0.5CoCrCuFeNiV1.0 | [38] | FCC + BCC + Im    | (7.4)          | 639|              |                  |                  |               |           |
| A0.5CoCrCuFeNiV1.2 | [38] | BCC               | (7.3)          | 579|              |                  |                  |               |           |
| A0.5CoCrCuFeNiV1.4 | [38] | BCC               | (7.3)          | 577|              |                  |                  |               |           |
| A0.5CoCrCuFeNiV1.6 | [38] | BCC               | (7.2)          | 594|              |                  |                  |               |           |
| A0.5CoCrCuFeNiV1.8 | [38] | BCC               | (7.2)          | 597|              |                  |                  |               |           |
| A0.5CoCrCuFeNiV2.0 | [38] | BCC               | (7.2)          | 587|              |                  |                  |               |           |
| A0.75CoCrCu0.25FeNiTi0.5| [25] | FCC + BCC         | (6.8)          | 1900| 2697         | 12               | 164(189)        |               |           |
| AlCoCrCuNiTi       | [42] | FCC               | (6.4)          | 1495| 8            | 36(167)          |                 |               |           |
| AlCoCrCuNiTi0.5    | [42] | Im                | (6.1)          | 1025| 3            | 36               |                 |               |           |
| AlCoCrCuNiTi0.8    | [42] | Im                | (3.9)          | 1325| 5            | 38               |                 |               |           |
| AlCoCrCuNiTiY      | [42] | Im                | (3.8)          | 1192| 4            | 37               |                 |               |           |
| AlCoFeNi           | [4]  | FCC               | (6.6)          | 456| C            | 964              |                 |               |           |
| AlCoFeNiVZr        | [27] | FCC               | (6.2)          | 790|              |                  |                 |               |           |
| CoCuFeNi           | [43] | FCC               | (8.6)          | 480| T            | 15               | 188             |               |           |
| CoCuFeNi0.02       | [43] | FCC               | (8.6)          | 548| T            | 17               | 187             |               |           |
| CoCuFeNi0.04       | [43] | FCC + Im          | (8.6)          | 594| T            | 18               |                 |               |           |
| CoCuFeNi0.05       | [43] | FCC + Im          | (8.6)          | 615| T            | 20               |                 |               |           |
| CoCuFeNi0.07       | [43] | FCC + Im          | (8.6)          | 632| T            | 19               |                 |               |           |
| CoCuFeNi0.1        | [43] | FCC + Im          | (8.6)          | 602| T            | 5                |                 |               |           |
| CoCuFeNi0.2        | [43] | FCC + Im          | (8.5)          | 261| T            | 2                |                 |               |           |
| CoCuFeNi0.5        | [43] | FCC + Im          | (8.3)          | 536|              |                  |                 |               |           |
| AlCoFeNi           | [39] | FCC + BCC         | (7.0)          | 578|              |                  |                 |               |           |
| AlCoFeNbNi         | [39] | FCC + BCC         | (5.9)          | 682|              |                  |                 |               |           |
| AlCoFeNiSi         | [39] | FCC + BCC         | (6.5)          | 626|              |                  |                 |               |           |
| AlCoFeNiTi         | [39] | FCC + BCC         | (6.9)          | 472|              |                  |                 |               |           |
| AlCoFeNiZr         | [39] | FCC + BCC + Im    | (8.4)          | 1400| 1900         | 14               | 190             |               |           |
| CoCuFeNi0.03       | [44] | FCC               | (8.4)          | 192| T            | 465              | 18              |               |           |
| CoCuFeNi0.05       | [44] | FCC + Im          | (8.4)          | 205| T            | 475              | 12              |               |           |
| CoCuFeNi0.08       | [44] | FCC + Im          | (8.3)          | 219| T            | 425              | 7               |               |           |
| CoCuFeNi0.10       | [44] | FCC + Im          | (8.3)          | 253| T            | 470              | 6               |               |           |
| CoCuFeNi0.20       | [44] | FCC + Im          | (8.3)          | 319| T            | 368              | 2               |               |           |
| CrCuFeNi           | [13] | FCC               | (8.1)          | 296|              |                  |                 |               |           |
| CrCuFeNi           | [13] | FCC               | (8.7)          | 263|              |                  |                 |               |           |
| AlCrCuFeNi0.6      | [45] | FCC + BCC         | (6.6)          | 496|              |                  |                 |               |           |
| AlCrCuFeNi0.8      | [45] | FCC + BCC         | (6.7)          | 486|              |                  |                 |               |           |
| AlCrCuFeNi         | [45] | FCC + BCC         | (6.8)          | 495|              |                  |                 |               |           |
| Composition (atomic) | Ref. | Type of phases | $\rho$ (g/cm$^3$) | HV | Type of tests | $\sigma_y$ (MPa) | $\sigma_{max}$ (MPa) | $\varepsilon$ (%) | $E$ (GPa) |
|----------------------|------|----------------|-----------------|-----|---------------|----------------|----------------|-------------|----------|
| AlCrCuFeNi1.2        | [45] | FCC + BCC      | (6.8)           | 407 |               |               |               |             |           |
| AlCrCuFeNi1.4        | [45] | FCC + BCC      | (6.9)           | 367 |               |               |               |             |           |
| AlCrCuFeNi2          | [46] | FCC + BCC      | (7.1)           |     |               |               |               |             |           |
| AlCrCuFeNiTi         | [47] | BCC + Im       | (6.3)           |     | C             | 1219          |               |             |           |
| Al0.2CrCuFeNi2       |      | FCC            | (8.0)           |     |               |               |               |             |           |
| Al0.4CrCuFeNi2       | [46] | FCC            | (7.8)           |     |               |               |               |             |           |
| Al0.6CrCuFeNi2       | [46] | FCC            | (7.5)           |     |               |               |               |             |           |
| Al0.8CrCuFeNi2       | [46] | FCC            | (7.3)           |     |               |               |               |             |           |
| Al1.2CrCuFeNi2       | [46] | FCC + BCC      | (6.9)           |     |               |               |               |             |           |
| AlCrCuFeNi           | [13] | FCC + BCC      | (6.8)           | 342 |               |               |               |             |           |
| Al1.125CuFe0.75NiTi1.125 | [48] | FCC + BCC      | (6.8)           | 342 |               |               |               |             |           |
| AlCuNiTi             |      | Im             | (2.7)           |     |               |               |               |             |           |
| Reaftery metal base HEAs and CCAs | | | | | | | | | |
| Al0.5MgSn0.2Zn0.5    | [49] | FCC + Im       | (2.9)           |     | C             | 546            | 546           |             |           |
| AlCuNiTi             |      | Im             | (2.7)           |     |               |               |               |             |           |
| Light metal base HEAs and CCAs | | | | | | | | | |
| Al0.25MoNbTiV        | [51] | BCC            | (5.6)           | 1300| 1430          |                   | 1             | (124)       |
| Al0.5MoNbTiV         | [51] | BCC + Im       | (5.8)           | 1550| 1570          |                   | < 1           | (1)         |
| Al0.5NbTiV           | [51] | BCC + Im       | (5.9)           | 1700| 1700          |                   |             | < 1         |
| Al0.4H0.6NbTaTiZr    | [52] | BCC            | (9.1)           | 1841| 2269          |                   | 10            | (110)       |
| Al0.3H1.0NbTaTiZr    | [53] | BCC            | (9.5)           | 353 | 1188          |                   | 50            | 63          | (108)     |
| Al0.5H1.0NbTaTiZr    | [53] | BCC            | (9.3)           | 396 | 1302          |                   | 46            | 97          | (107)     |
| Al0.75H1.5NBaTiZr    | [53] | BCC            | (9.1)           | 427 | 1415          |                   | 30            | 102         | (105)     |
| AlMo0.5NbTa0.5TiZr   | [52] | BCC            | (7.1)           | 591 | 2000          |                   | 10            | (123)       |
| Al0.25MoNbTiV        | [54] | BCC            | (7.1)           | 460 | 1250          |                   | 13            | (164)       |
| Al0.5MoNbTiV         | [54] | BCC            | (6.8)           | 487 | 1625          |                   | 11            | (158)       |
| Al0.75MoNbTiV        | [54] | BCC            | (6.6)           | 517 | 1260          |                   | 8             | (154)       |
| AlMo0.5NbTaTiV       | [54] | BCC            | (6.4)           | 537 | 1375          |                   | 3             | (150)       |
| Al0.25NbTaTiV        | [55] | BCC            | (8.8)           | 1330| 92            | (130)           |               |             |           |
| Al0.5NbTaTiV         | [55] | BCC            | (8.5)           | 1014| 97            | (127)           |               |             |           |
| AlNbTaTiV            | [55] | BCC            | (7.9)           | 993 |               | 101            | (121)         |             |           |
| Al0.3NbTa0.8Ti1.4V0.2Zr1.3 | [52] | BCC            | (7.7)           | 500 | 1965          | 2061           | 5             | (110)       |
| Al0.5NbTa0.8Ti1.5V0.2Zr | [52] | BCC            | (7.6)           | 530 | 2035          | 2105           | 5             | (111)       |
| Al0.3NbTaTi1.4Zr1.3  | [52] | BCC            | (8.1)           | 490 | 1965          | 2054           | 5             | (113)       |
| Al0.15Ta0.5Ti1.5Sr0.5 | [52] | BCC            | (6.8)           | 408 | 1280          | 1367           | 4             | (106)       |
| AlNbTiV              | [56] | BCC            | (5.5)           | 448 | 1020          | 1318           | 5             | (105)       |
| AlNbTiV              | [51] | BCC            | (5.5)           |     | 1000          | 1280           | 5             | (105)       |
| CrHfNbTiZr           | [57] | BCC + Im       | (8.2)           | 464 | 1375          | 2130           | 3             | 112         |
| CrMo0.5NbTa0.5TiZr   | [58] | BCC + Im       | (8.0)           | 540 | 1595          | 2046           | 5             |             |           |
| CrNbTiVZr            | [59] | BCC + Im       | (6.6)           | 482 | 1298          |                   | 3             |             |           |
| CrNbTiZr             | [59] | BCC + Im       | (6.6)           | 418 | 1260          |                   | 6             |             |           |
| FeMoNiTiVZr          | [27] | BCC + Im       | (7.1)           | 740 |               |               |               |             |           |
| Hf0.5Mo0.5NbTiZr     | [60] | BCC + Im       | (7.9)           | 400 | 1178          |                   | 25            |             |           |
| Hf0.5Mo0.5NbSi0.1TiZr| [60] | BCC + Im       | (7.7)           | 442 | 1365          |                   | 28            |             |           |
| Hf0.5Mo0.5NbSi0.3TiZr| [60] | BCC + Im       | (7.5)           | 494 | 1428          |                   | 23            |             |           |
| Hf0.5Mo0.5NbSi0.5TiZr| [60] | BCC + Im       | (7.2)           | 524 | 1605          |                   | 23            |             |           |
| Hf0.5Mo0.5NbSi0.7TiZr| [60] | BCC + Im       | (7.0)           | 580 | 1604          |                   | 12            |             |           |
| Hf0.5Mo0.5NbSi0.9TiZr| [60] | BCC + Im       | (6.8)           | 640 | 1677          |                   | 9             |             |           |
| Hf0.5Mo0.5NbTiZr0.1   | [61] | BCC + Im       | (7.8)           |     | 1183          | 2139           | 38            |             |           |
| Hf0.5Mo0.5NbTiZr0.3   | [61] | BCC + Im       | (7.7)           |     | 1201          | 1965           | 33            |             |           |
| HfMo0.25NbTaTiZr     | [62] | BCC            | (9.9)           | 395 | 1112          |                   | 50            | 96          | (121)     |
| HfMo0.5NbTaTiZr      | [62] | BCC            | (10.0)          | 480 | 1317          |                   | 50            | 102         | (130)     |
Table 1 (continued)

| Composition (atomic) | Ref. | Type of phases | $\rho$ (g/cm$^3$) | HV Type of tests | $\sigma^\prime$ (MPa) | $\sigma_{\text{max}}$ (MPa) | $\varepsilon$ (%) | $E$ (GPa) |
|----------------------|------|----------------|-------------------|-------------------|---------------------|---------------------|---------------|----------|
| HfMo0.75NbTaTiZr     | [62] | BCC            | 10.0 (9.9)        | 492               | 1373                | 50                  | 109 (139)     |          |
| HfMoNbTaTiZr         | [63] | BCC            | 10.0              | 505               | 1512                | 12                  | 115 (147)     |          |
| HfMoTaTiZr           | [63] | BCC            | 10.2 (10.2)       | 542               | 1600                | 4                   | 155           |          |
| HfMoNbTiZr           | [64] | BCC            | (8.7)             |                   | 1803                | 10                  | 139           |          |
| HfNbSi0.5TiV         | [65] | BCC + Im       | 8.6 (7.8)         | 490               | 1399                | 1.6                 | 115           |          |
| HfNbSi0.5TiVZr       | [66] | BCC + Im       | 7.8 (7.5)         | 464               | 1540                | 1643               | 17           |          |
| HfNbTaZr             | [67] | BCC            | (11.1)            | 365               | 1315                |                    |               | (109)    |
| Hf0.5Nb0.5Ta0.5Ti1.5Zr| [68] | BCC            | (8.7)             |                   | C                   | 1719               | 10            |          |
| HfNbTaTiZr           | [69,70]| BCC            | (9.9)             |                   | C                   | 295                | 50            | (111)    |
| HfNbTaTiZr           | [69,70]| BCC            | (9.9)             |                   | C                   | 1803               | 1719          | (139)    |
| Hf0.5Nb0.5Ta0.5Ti1.5Zr| [68] | BCC            | (8.2)             |                   | 492                 | 1399               | 1680          | 11       |
| HfNbTaTiZr           | [62] | BCC            | 9.9 (9.9)         | 542               | 1512                | 12                  | 147           |          |
| HfNbTaTiZr           | [62] | BCC            | 9.9 (9.9)         | 335               | 1512                | 12                  | 147           |          |
| Mo0.3NbTiVZr         | [74] | BCC            | 6.7               | C                 | 1289                |                    |               | 42        |
| Mo0.5NbTiVZr         | [74] | BCC            | 6.8               |                   | 1473                |                    |               | 32        |
| Mo0.7NbTiVZr         | [74] | BCC            | 7.0               | C                 | 1706                |                    |               | 32        |
| MoNbTiVZr            | [74] | BCC            | 7.1               | C                 | 1779                |                    |               | 32        |
| Mo1.1NbTiVZr         | [74] | BCC            | 7.3               | C                 | 1496                |                    |               | 30        |
| Mo1.5NbTiVZr         | [74] | BCC            | 7.4               | C                 | 1603                |                    |               | 20        |
| Mo1.7NbTiVZr         | [74] | BCC            | 7.5               | C                 | 1645                |                    |               | 15        |
| Mo2NbTiVZr           | [74] | BCC            | 7.6               | C                 | 1765                |                    |               | 12        |
| MoNbTiVO.25Zr        | [75] | BCC            | (7.3)             | C                 | 1776                | 3893               | 30            | (153)    |
| MoNbTiVO.50Zr        | [75] | BCC            | (7.2)             | C                 | 1647                | 3307               | 28            | (152)    |
| MoNbTiVO.75Zr        | [75] | BCC            | (7.2)             | C                 | 1708                | 3929               | 29            | (150)    |
| MoNbTiV1.0Zr         | [75] | BCC            | (7.1)             | C                 | 1786                | 3828               | 26            | (149)    |
| MoNbTiV1.5Zr         | [75] | BCC            | (7.1)             | C                 | 1735                | 3300               | 20            | (147)    |
| MoNbTiV2.0Zr         | [75] | BCC            | (7.0)             | C                 | 1538                | 3176               | 23            | (146)    |
| MoNbTiV2.5Zr         | [75] | BCC            | (6.9)             | C                 | 1418                | 2508               | 20            | (143)    |
| MoNbTiZr             | [75] | BCC            | (7.3)             | C                 | 1592                | 3450               | 34            | (155)    |
| NbTaTiV              | [55] | BCC            | (9.2)             | C                 | 1092                |                    | 106 (134)     |          |
| NbTaV                | [76] | BCC            | (12.8)            | 492               | 1530                | 12                  | 208           |          |
| NbTaTiVW             | [76] | BCC + HCP      | (11.1)            | 447               | 1420                | 20                  |               |          |
| NbTiVO.3Zr           | [74] | BCC            | 6.5               | C                 | 866                 |                    |               | 45        |
| NbTiVO.3Mo0.1        | [74] | BCC            | 6.6               | C                 | 932                 |                    |               | 45        |
| NbTiVO.3Mo0.3        | [74] | BCC            | 6.8               | C                 | 1312                |                    |               | 50        |
| NbTiVO.3Mo0.5        | [74] | BCC            | 6.9               | C                 | 1301                |                    |               | 43        |
| NbTiVO.3Mo0.7        | [74] | BCC            | 7.1               | C                 | 1436                |                    |               | 27        |
| NbTiVO.3Mo           | [74] | BCC            | 7.3               | C                 | 1455                |                    |               | 25        |
| NbTiVO.3Mo1.3        | [74] | BCC            | 7.4               | C                 | 1603                |                    |               | 20        |
| NbTiVO.3Mo1.5        | [74] | BCC            | 7.5               | C                 | 1576                |                    |               | 8         |
| NbTiZr               | [74] | BCC            | 6.5               | C                 | 1104                |                    |               | 50        |
| NbTiZr               | [59] | BCC            | (6.5)             | 335               | 1105                | > 50 (104)         |               |          |
| NbTiZr               | [59] | BCC            | (6.4)             | 304               | 918                 | > 50 (109)         |               |          |

Other HEAs and CCAs

| Composition (atomic) | Ref. | Type of phases | $\rho$ (g/cm$^3$) | HV Type of tests | $\sigma^\prime$ (MPa) | $\sigma_{\text{max}}$ (MPa) | $\varepsilon$ (%) | $E$ (GPa) |
|----------------------|------|----------------|-------------------|-------------------|---------------------|---------------------|---------------|----------|
| CoCrCuFeNiTiVZr      | [27] | (7.1)          | 680               |                   |                     |                    |               | (168)    |
| CoCrFeMoNiTiVZr      | [27] | (7.3)          | 850               |                   |                     |                    |               | (193)    |
| CoFeNiV              | [77] | FCC            | (7.8)             | 238               |                     |                    |               | (187)    |
| CoFeMo0.2NiV         | [77] | FCC + Im       | (8.0)             | 267               |                     |                    |               |          |
| CoFeMo0.4NiV         | [77] | FCC + Im       | (8.1)             | 402               |                     |                    |               |          |
| CoFeMo0.6NiV         | [77] | FCC + Im       | (8.2)             | 557               |                     |                    |               |          |
| CoFeMo0.8NiV         | [77] | FCC + Im       | (8.3)             | 606               |                     |                    |               |          |
| CoFeMoNiV            | [77] | FCC + Im       | (8.4)             | 625               |                     |                    |               |          |
| CoFeMoNi1.2V         | [77] | FCC + Im       | (8.4)             | 602               |                     |                    |               |          |
Table 1 (continued)

| Composition (atomic) | Ref. | Type of phases | $\rho$ (g/cm³) | HV | Type of tests | $\sigma^\nu$ (MPa) | $\sigma^\max$ (MPa) | $\epsilon$ (%) | $E$ (GPa) |
|----------------------|------|----------------|--------------|----|--------------|-----------------|-----------------|-------------|----------|
| CoFeMoNi1.4V         | [77] | FCC + Im       | (8.5)        | 538|              |                 |                 |             |          |
| CoFeMoNi1.6V         | [77] | FCC + Im       | (8.5)        | 520|              |                 |                 |             |          |
| CoFeMoNi1.8V         | [77] | FCC + Im       | (8.5)        | 510|              |                 |                 |             |          |
| CoFeMoNi2V           | [77] | FCC + Im       | (8.5)        | 382|              |                 |                 |             |          |
| CoFeMoNiTiVZr        | [27] |                | (7.3)        | 790|              |                 |                 |             |          |
| CuFeNiTiVZr          | [27] |                | (6.8)        | 590|              |                 |                 |             |          |
| CoCrCuFeMnNiTiV     | [78] | FCC + BCC + Im | (7.3)        | C  | 1312         | 1312            | < 1             | 74          | (142)    |
| AI1Ij(CoCrCuFeMnNiTiV) | 88.9 | FCC + BCC      | (6.7)        | C  | 1862         | 2431            | < 1             | 164        | (182)    |
| Al20(CoCrCuFeMnNiTiV)/80 | [78] | BCC            | (6.1)        | C  | 1465         | 2016            | 2               | 190        | (180)    |
| Al40(CoCrCuFeMnNiTiV)/60 | [78] | BCC + Im       | (5.1)        | C  | 1461         | 1461            | < 1             | 163        |          |
| AlFeNiTiVZr          | [27] | BCC            | (5.9)        | 800|              |                 |                 |             |          |
| (CuMnNi)75Zn25       | [79] | FCC            | (8.3)        | 147 | 215          |                 |                 | > 60        | (169)    |
| (CuMnNi)80Zn20       | [79] | FCC            | (8.3)        | 109 | 140          |                 |                 | > 65        | (171)    |
| (CuMnNi)90Al110      | [79] | FCC + Im       | (8.1)        | 241 | 515          |                 |                 | 40          |          |
| (CuMnNi)90Sn10       | [79] | FCC + Im       | (8.3)        | 318 | 630          |                 |                 | 20          |          |
| (CuMnNi)95Al5        | [79] | FCC            | (8.3)        | 166 | 330          |                 |                 | > 45        | (174)    |
| (CuMnNi)95Sn5        | [79] | FCC + Im       | (8.4)        | 205 | 380          |                 |                 | > 63        |          |

Table 2

HEAs and CCAs for which mechanical tests are reported in literature as a function of temperature.

| Composition | Refs. | Phase         | $\rho$ (g/cm³) | $T$ (°C) | $\sigma^\nu$ (MPa) | $\epsilon$ (%) |
|-------------|-------|---------------|----------------|----------|--------------------|----------------|
| Al0.3NbTa0.8Ti1.4V0.2Zr1.3 | [52] | BCC           | 7.8 (7.7)      | 25       | 1965               | 5              |
|             |       |               |                | 800      | 678                | > 50           |
|             |       |               |                | 1000     | 166                | > 50           |
| Al0.3NbTaTi1.4Zr1.3   | [52] | BCC           | 8.2 (8.1)      | 25       | 1965               | 5              |
|             |       |               |                | 800      | 362                | > 50           |
|             |       |               |                | 1000     | 236                | > 50           |
| Al0.4Hf0.6NbTaTiZr    | [52] | BCC           | 9 (9.1)        | 25       | 1841               | 10             |
|             |       |               |                | 800      | 796                | > 50           |
|             |       |               |                | 1000     | 298                | > 50           |
| Al0.5CoCrCuFeNi      | [80] | FCC           | 7.9 (7.6)      | 1000     | 150                | 5              |
|             |       |               |                | 25       | 388                |                |
|             |       |               |                | 300      | 411                |                |
|             |       |               |                | 500      | 421                |                |
|             |       |               |                | 700      | 426                |                |
|             |       |               |                | 900      | 230                |                |
|             |       |               |                | 1100     | 80                 |                |
| Al0.5NbTa0.8Ti1.5V0.2Zr | [52] | BCC           | 7.4 (7.6)      | 25       | 2035               | 5              |
|             |       |               |                | 800      | 796                | > 50           |
|             |       |               |                | 1000     | 220                | > 50           |
| Al2CoCrCuFeNi        | [80] | BCC           | 6.7 (6.3)      | 1000     | 116                | 5              |
|             |       |               |                | 1100     | 79                 |                |
|             |       |               |                | 25       | 1620               |                |
|             |       |               |                | 600      | 805                |                |
|             |       |               |                | 500      | 1120               |                |
|             |       |               |                | 700      | 567                |                |
|             |       |               |                | 900      | 214                |                |
|             |       |               |                | 800      | 302                |                |
| AlCoCrCuFeNi         | [80] | FCC + BCC     | 7.4 (7.1)      | 1000     | 47                 | 5              |
|             |       |               |                | 25       | 948                |                |
|             |       |               |                | 600      | 561                |                |
|             |       |               |                | 700      | 307                |                |
|             |       |               |                | 800      | 172                |                |
|             |       |               |                | 900      | 98                 |                |
Table 2 (continued)

| Composition                  | Refs. | Phase | \( \rho \) (g/cm\(^3\)) | \( T \) (°C) | \( \sigma' \) (MPa) | \( \varepsilon \) (%) |
|------------------------------|-------|-------|-----------------|-------------|-----------------|------------------|
| AlCrMoNbTi                  | [81]  | BCC   | (6.6)           | 25          |                 |                  |
|                             |       |       | 400             | 1080        | 2               |                  |
|                             |       |       | 600             | 1060        | 3               |                  |
|                             |       |       | 800             | 860         | 2               |                  |
|                             |       |       | 1000            | 594         | 15              |                  |
|                             |       |       | 1200            | 105         | 24              |                  |
| AlMo0.5NbTa0.5TiZr          | [52]  | BCC   | 7.4 (7.1)       | 25          |                 |                  |
|                             |       |       | 800             | 2000        | 10              |                  |
|                             |       |       | 1000            | 1597        | 11              |                  |
|                             |       |       | 1200            | 745         | > 50            |                  |
| AlNb1.5Ta0.5Ti1.5Zr0.5      | [52]  | BCC   | 6.9 (6.8)       | 25          |                 |                  |
|                             |       |       | 800             | 1280        | 4               |                  |
|                             |       |       | 1000            | 728         | > 12            |                  |
|                             |       |       | 1200            | 403         | > 50            |                  |
| AlNbTiV                     | [56]  | BCC   | 5.6 (5.5)       | 25          |                 |                  |
|                             |       |       | 600             | 1020        | 5               |                  |
|                             |       |       | 800             | 810         | 12              |                  |
|                             |       |       | 1000            | 685         | 50              |                  |
| CrHfNbTiZr                  | [57]  | BCC + Im | (8.1)           | 25          |                 |                  |
|                             |       |       | 300             | 1375        | 3               |                  |
|                             |       |       | 500             | 1420        | 4               |                  |
|                             |       |       | 700             | 1457        | 2               |                  |
|                             |       |       | 900             | 1322        | 1               |                  |
| CrMo0.5NbTa0.5TiZr          | [28]  | BCC + Im | 8.2 (8)         | 25          |                 |                  |
|                             |       |       | 800             | 1595        | 5               |                  |
|                             |       |       | 1000            | 983         | 6               |                  |
|                             |       |       | 1200            | 546         | 50              |                  |
| CrNbTiVZr                   | [59]  | BCC + Im | 6.6             | 25          |                 |                  |
|                             |       |       | 600             | 1298        | 3               |                  |
|                             |       |       | 800             | 1230        | 10              |                  |
|                             |       |       | 1000            | 615         | > 50            |                  |
|                             |       |       | 1200            | 259         | > 50            |                  |
| CrNbTiZr                    | [59]  | BCC + Im | 6.7 (6.6)       | 25          |                 |                  |
|                             |       |       | 600             | 1260        | 6               |                  |
|                             |       |       | 800             | 1035        | > 50            |                  |
|                             |       |       | 1000            | 300         | > 50            |                  |
|                             |       |       | 1200            | 115         | > 50            |                  |
| HfMoNbTaTiZr                | [63]  | BCC   | 9.97 (9.95)     | 25          |                 |                  |
|                             |       |       | 800             | 1512        | 12              |                  |
|                             |       |       | 1000            | 1007        | 23              |                  |
|                             |       |       | 1200            | 814         | 30              |                  |
|                             |       |       | 1400            | 556         | 30              |                  |
| HfMoNbTiZr                  | [64]  | BCC   | 8.7             | 25          |                 |                  |
|                             |       |       | 800             | 1575        | 9               |                  |
|                             |       |       | 1000            | 825         | 50              |                  |
|                             |       |       | 1200            | 635         | 50              |                  |
|                             |       |       | 1400            | 187         | 50              |                  |
| HfMoTaTiZr                  | [63]  | BCC   | 10.24 (10.21)   | 25          |                 |                  |
|                             |       |       | 800             | 1600        | 4               |                  |
|                             |       |       | 1000            | 1045        | 19              |                  |
|                             |       |       | 1200            | 855         | 30              |                  |
|                             |       |       | 1400            | 404         | 30              |                  |
| HfNbSi0.5TiV                | [65]  | BCC + Im | 8.6 (7.8)       | 25          |                 |                  |
|                             |       |       | 800             | 1399        | 11              |                  |
|                             |       |       | 1000            | 875         | 50              |                  |
|                             |       |       | 1200            | 240         | 50              |                  |
| HfNbSi0.5TiVZr              | [66]  | BCC + Im | 7.75 (7.5)      | 0           |                 |                  |
|                             |       |       | 600             | 1540        | 17              |                  |
|                             |       |       | 800             | 1252        | 50              |                  |
|                             |       |       | 1200            | 427         | 50              |                  |
| HfNbTaTiZr                  | [40]  | BCC   | 9.9             | 25          |                 |                  |
|                             |       |       | 600             | 929         | 50              |                  |
|                             |       |       | 800             | 675         | 50              |                  |
|                             |       |       | 1000            | 535         | 50              |                  |
|                             |       |       | 1200            | 295         | 50              |                  |
|                             |       |       | 1400            | 92          | 50              |                  |
|                             |       |       |                 | 1400        | 790             | 50              |
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