

Element	Ref.	Purity	Synthesis route	Mechanical test method	Grain size measurement technique
Be	6	H = 5 ppm N = 10 C = 30 O = 100	Powder was prepared by grinding starter material in a Be mortar and pestle. The powder was then cold-compacted in a Be die, and sealed in steel cans that were extruded at 1173 K into flats with 1.9 x 0.19 cm cross-sections. Tensile specimens were cut from the flats so that their loading axes were parallel to the extrusion direction.	Tension test	Do not report (DNR)
Be	155	99.4 at%	Films 0.2 to 3 μm thick were grown using magnetron sputtering.	Nanoindentation hardness	Linear intercept
Be	148	C = 250 ppm	Powder was prepared by mechanically milling electrolytic Be in a Be-lined vial under an argon atmosphere. The powders were then loaded into a stainless steel can that was hot isostatic pressed (HIP) using a pressure of 103 MPa and a soak temperature of 1338 K.	Tension test gauge length (L) = 1.3 cm gauge diameter (D) = 4 mm strain rate ($\dot{\epsilon}$) = $7 \times 10^{-4} \text{ s}^{-1}$	Linear intercept
Be	147	99.95 at%	Tensile specimens were cut from 1.5 mm thick plates that had been annealed at 1073 K for between 1.5 and 150 minutes. The tensile specimens were annealed for an additional 1 hr at 973 K after being machined.	Tension test $\dot{\epsilon} = 10^{-4} \text{ s}^{-1}$	DNR
Be	154	BeO, wt% = 0.61 C = 250 ppm Fe = 200 Al = 20 Si = 65 Ni = 90	Powder was prepared by mechanically milling starter material in a vibrating disk mill with a container made from Be. The as-milled powder was HIPed at temperatures between 1193 and 1343 K for 3 hrs under a pressure of 100 MPa. The tensile specimens' loading axes were parallel to the cylindrical axes of the HIP compacts	Tension test Vickers hardness	Linear intercept
Be	156	O, wt% = 0.83	Powder was prepared by mechanically milling starter material in a sealed planetary ball mill using a vial lined with a Be sleeve. The as-milled powder was classified, and compacts were made from each interval of particle diameters by uniaxially hot pressing the powder in a graphite mold.	Tension test L = 2 cm D = 0.4 cm $\dot{\epsilon} = 4.3 \times 10^{-4} \text{ s}^{-1}$ Vickers hardness	Linear intercept
Be	152	Fe, wt% = 0.08 Al = 0.05 Si = 0.08	Bars with 1.27 cm diameter were prepared by extruding electrolytic flake at 1323 K. The reduction in area during the extrusion step was 90%. Additional tensile specimens were stamped out of hot-rolled Be sheets.	Tension test L = 1.6 cm D = 0.46 cm	Linear intercept
Be	153	BeO, wt% = 1.89	Powder was prepared by mechanically milling starter material in an attrition mill. The as-milled powder was HIPed at 1770 K for a soak time of 2 hrs under a pressure	Tension test L = 2.4 cm D = 0.35 cm	Areal density

			of 200 MPa. The HIPed compacts were heated to 1173 K and rolled to a 50% reduction in area.	$\dot{\epsilon} = 10^{-4} \text{ s}^{-1}$	
Be	145	DNR	Sample were machined from extruded rod.	Tension test	DNR
Be	146	BeO, wt% = 1 C = 0.02	Test specimens were machined from hot-pressed compacts. Some of the test specimens were annealed at 1519 K for times between 1 and 4 hrs.	Tension test L = 1.27 cm D = 0.32 cm $\dot{\epsilon} = 3 \times 10^{-3} \text{ s}^{-1}$	Linear intercept
Be	149	DNR	Samples were prepared using powder metallurgy.	DNR	DNR
Be	150	BeO, wt% = 0.6 C = 400 ppm Si = 100	Compacts made by HIP'ing powder compacts were extruded and annealed at temperatures between 1070 and 1170 K.	Tension test L = 1.3 cm D = 0.33 cm $\dot{\epsilon} = 6 \times 10^{-5} \text{ s}^{-1}$	DNR
Mg	7	99.97%	Samples were machined from extruded and hot-rolled flats. The specimens were then annealed at temperatures between 500 and 880K for 1 hr.	Tension test L = 5 cm D = 6.4 mm $\dot{\epsilon} = 10^{-4}$	DNR
Mg	157	DNR	Samples were machined from extruded bars that had been annealed at temperatures up to 775 K.	Tension test D = 1 cm	DNR
Mg	10	99.87%	A cast slab was hot-forged into a 4 mm thick plate. The forged plate's thickness was then reduced to 1.6 mm by rolling at 570 K. Samples were cut from the rolled plate.	Tension test L = 1.5 cm D = 0.3 cm $\dot{\epsilon} = 5 \times 10^{-4} \text{ s}^{-1}$	Linear intercept
Mg	159	99.95%	Tensile specimens were cut from rolled Mg sheet.	Tension test L = 5 cm gauge width (w) = 0.5 cm gauge thickness (t) = 0.1 cm $\dot{\epsilon} = 1.7 \times 10^{-4} \text{ s}^{-1}$	DNR
Mg	160	99.8%	Mg powder was prepared by mechanically milling Mg chips in a ball mill using a stainless steel vial and media. The as-milled powders were consolidated by hot extrusion at 673 K. The grain size of the consolidated rods was controlling by adjusting the milling time between 0 and 24 hrs.	Compression test height (h) = 1.5 cm diameter (D) = 0.8 cm $\dot{\epsilon} = 10^{-3} \text{ s}^{-1}$	X-ray diffraction (XRD)
Mg	161	99.5%	Rods were processed by equal channel angular extrusion using 4 passes through a 90° angle, rotating the specimen by 180° between passes.	Compression test h = 0.6 cm D = 0.3 cm $\dot{\epsilon} = 10^{-3} \text{ s}^{-1}$	Linear intercept

Mg	162	99.6%	Cylinders were cast at 1053 K into sand molds and steel cylinders with varying amounts of grain refiner. The as-cast cylinders were solution heat-treated prior to testing.	Tension test L = 4 cm D = 0.6 to 2.4 cm Compression test h = 4 cm D = 2 cm $\dot{\epsilon} = 3 \times 10^{-4} \text{ s}^{-1}$	Linear intercept
Mg	163	99.999%	Mg films with a thickness of 250 nm were deposited onto a Si substrate using electron beam evaporation. The Si substrate was then etched away using XeF ₂ .	Tension test t = 250 nm $\dot{\epsilon} = 5 \times 10^{-4} \text{ s}^{-1}$	Circular equivalent diameter
Mg	158	Commercial purity (CP) Mg	Samples were machined from extruded bars. The grain sizes were varied by annealing the specimens at temperatures between 375 and 775 K for 30 minutes.	Tension test L = 1.7 cm D = 4.5 mm $\dot{\epsilon} = 10^{-3} \text{ s}^{-1}$	Circular equivalent diameter
Hf	138	99.9%	Compression specimens were cut from sheet that had been upset-forged and clock rolled. The specimens were annealed in vacuum at temperatures between 1123 and 1273 K for 1 hr.	Compression test h = 0.5 cm D = 0.5 cm $\dot{\epsilon} = 10^{-3} \text{ to } 10^{-1} \text{ s}^{-1}$	DNR
Zr	136	CP Zr	Plates cooled to 77 K were subjected to 3 passes of a surface circulation rolling treatment.	Nanoindentation hardness	Circular equivalent diameter
Zr	134	O = 1 ppt C = 125 ppm	Buttons prepared by non-consumable arc melting were hot and cold rolled into 500 micron thick sheets. The sheets were then annealed at temperatures between 850 and 1115 K for times between 1 and 144 hrs.	Tension test L = 1.25 cm w = 0.35 cm t = 0.5 mm	Linear intercept
Zr	135	CP Zr	A recrystallized cylinder was compressed at temperatures between 900 and 1100 K in high purity argon using strain rates between 10^{-4} and 10^{-1} . Compression specimens were machined from these samples.	Compression test H = 0.475 cm D = 0.395 cm $\dot{\epsilon} = 10^{-3} \text{ s}^{-1}$	Circular equivalent diameter
Zr	137	99.8%	Zr sheets were processed by accumulative roll-bonding. Rolling passes were conducted at 600 K and achieved a 75% reduction in area.	Tension test	Linear intercept
Zr	133	O = 1.3 ppt N = 40 ppm C = 200 ppm	As-received rod with a 2.5 cm diameter was cold-rolled and swaged down to 8 mm diameter. The samples cut from this rod were annealed at temperatures between 825 and 1125 K for times between 10 min and 48 hrs.	Tension test L = 2.5 cm D = 3 mm $\dot{\epsilon} = 5 \times 10^{-4} \text{ s}^{-1}$	Linear intercept
Co	139-141	99.9%	Films with a thickness of 200 μm were electrodeposited using a pulsed current. Coarse grained specimens were prepared by annealing rolled Co sheets with the same thickness for 1 hr at 1073 K.	Tension test L = 5 mm w = 2.5 mm t = 200 μm	Circular equivalent diameter

				$\dot{\epsilon} = 2.5 \times 10^{-3} \text{ s}^{-1}$	
Co	142	99.9%	Foils with a thickness of 120 μm were electroplated using a pulsed current. The as-deposited films were then annealed at temperatures between 523 and 773 K in a vacuum of 10^{-5} torr. Coarse grained Co was prepared by annealing rolled Co sheets for 4 hrs at 1173 K.	Tension test L = 5 mm w = 2 mm t = 120 μm $\dot{\epsilon} = 10^{-7}$ to 10^{-1} s^{-1}	Circular equivalent diameter
Co	143	99.5%	Powders were mechanically milled in planetary ball mill and then consolidated using high pressure torsion, using 5 revolutions and a confining pressure of 6 GPa.	Vickers hardness	XRD
Co	144	O wt% = 15	Nanopowders prepared by inert gas condensation were consolidated by upset-forging.	Vickers hardness	DNR
Cd	173	99.99%	Blocks 20 mm thick were cold-rolled into 750 μm thick foils. The foils were annealed in a water bath at temperatures between 325 and 350 K for various times.	Tension test L = 1.25 cm w = 3 mm t = 750 μm $\dot{\epsilon} = 6.56 \times 10^{-5} \text{ s}^{-1}$	Linear intercept
Cd	174	99.98%	Ingots were warm rolled into 1.3 mm strip, from which tensile specimens were blanked.	Tension test L = 2.5 cm D = 3 mm	DNR
Cd	172	99.999%	12 cm thick cast billets were cold-rolled into 750 μm thick foils. The grain size was varied by changing the reduction in area in the final roll pass and by annealing.	Tension test L = 2 cm w = 5 mm t = 750 μm $\dot{\epsilon} = 10^{-4} \text{ s}^{-1}$	DNR
Zn	164	99.99%	A 1.27 cm diameter rod was warm- and cold-rolled into a 0.79 cm rod. Test specimens cut from the rod were annealed at temperatures between 323 and 473 K.	Tension test L = 2.5 cm D = 0.3 cm $\dot{\epsilon} = 2 \times 10^{-4} \text{ s}^{-1}$ Temperature = 273 K	Linear intercept
Zn	168	99.8%	A 1 cm thick plate was rolled into 1 mm thick sheet. Tensile specimens were stamped out of the sheet and annealed at temperatures between 403 and 686 K.	Tension test $\dot{\epsilon} = 8 \times 10^{-3} \text{ s}^{-1}$	Linear intercept
Zn	165	99.95%	Ingots were rolled at 400 K to a 90% reduction in area. The sheets were then annealed in vacuum for 1 or 2 hrs at temperatures between 390 and 560 K. The tensile specimens' loading axes were parallel to the rolling direction.	Tension test L = 8.7 cm w = 1.5 cm t = 0.9 mm $\dot{\epsilon} = 1.93 \times 10^{-4} \text{ s}^{-1}$	Linear intercept
Zn	167	99.9%	Zn powder was high energy ball milled, and consolidated <i>in-situ</i> .	Miniaturized disk bend test	Circular equivalent diameter

				$\dot{\epsilon} = 10^{-4} \text{ s}^{-1}$	
Zn	166	99.9%	Zn powder was high energy ball milled, and consolidated <i>in-situ</i> .	Miniaturized disk bend test $\dot{\epsilon} = 10^{-4} \text{ s}^{-1}$	Circular equivalent diameter
Zn	169	DNR	Nanostructured thin films were grown using pulsed laser deposition.	Nanoindentation hardness	Circular equivalent diameter
Zn	170	DNR	Nanostructured thin films were grown using pulsed laser deposition.	Nanoindentation hardness	Circular equivalent diameter
Ti	131	O = 2.6 ppt N = 100 ppm C = 80 H = 36	Wire with a 1.6 mm diameter wire was prepared by cold-swaging 6.3 mm diameter rod. Tensile specimens cut from the swaged wire were annealed for 10 to 960 minutes at temperatures between 723 and 1123 K in a vacuum of 10^{-5} torr.	Tension test L = 2.5 cm D = 1.6 mm $\dot{\epsilon} = 3.3 \times 10^{-4} \text{ s}^{-1}$	Linear intercept
Ti	124	O = 300 ppm C = 120 N = 40 H = 6	Slabs were cold-rolled into 1 mm thick plates. Tensile specimens cut from the rolled plate were sealed in evacuated quartz tubes and annealed at temperatures between 813 and 1000 K for soak times between 2 and 2.5 hrs.	Tension test L = 3 cm w = 0.38 cm t = 0.7 mm	DNR
Ti	125	99.8, at%	Ti powders were mechanically milled in a planetary ball mill under an inert atmosphere for various times. The as-milled powders were then mounted in epoxy and cross-sectioned.	Vickers hardness	XRD
Ti	126	99.53%	A 10 mm diameter disk was processed by high pressure torsion using a confining pressure of 5 GPa. The specimens were then annealed in a vacuum of 10^{-5} torr at temperatures between 523 and 823 K for 2 hrs. Test specimens were cut from the annealed disks using an electric-discharge machining.	Miniaturized disk bend test Vickers hardness	Circular equivalent diameter
Ti	128	O, wt% = 0.01 Fe = 0.06 N = 0.01 H = 0.01	Rods were processed by equal channel angular extrusion using 6 passes through a 110° angle, rotating the specimen by 90° between passes.	Tension test L = 0.5 cm w = 0.2 cm t = 0.1 cm $\dot{\epsilon} = 3.3 \times 10^{-3} \text{ s}^{-1}$ Vickers hardness	Circular equivalent diameter
Ti	129	O, wt% = 0.14 Fe = 0.04 N = 0.005 C = 0.003	A 12.7 mm thick sheet was cold-rolled down to thicknesses between 1.4 and 2 mm. Tensile specimens cut from the sheet were annealed at temperatures between 873 and 1123 K for between 5 and 600 minutes. The tensile specimens' loading axes were parallel to the rolling direction.	Tension test L = 2.5 cm w = 0.5 cm	Linear intercept
Ti	130	N, wt% = 0.005	Specimens were machined from cold-swaged rods.	Tension test	DNR

				L = 2 cm D = 3 mm $\dot{\epsilon} = 10^{-4} \text{ s}^{-1}$	
Ti	123	O = 30 ppm C = 18 N = 110 H = 18	Rods with a 6 mm diameter were cold-swaged into wire with a diameter of 2 mm. The wire was annealed at temperatures between 773 and 973 K for times ranging from 1 to 60 minutes	Tension test $\dot{\epsilon} = 3.3 \times 10^{-4} \text{ s}^{-1}$	Linear intercept
Ti	127	CP Ti	Disks 10 mm in diameter were processed by high pressure torsion at ambient temperature.	Vickers hardness	Circular equivalent diameter
Ti	132	C, wt% = 0.033 N = 0.010 H = 0.013 O = 0.002	Cold-rolled strip was annealed at temperatures between 575 and 875 for times ranging from 1 to 3000 minutes.	Vickers hardness	Linear intercept
Cu	78	99.999%	A 9.2 cm diameter rod was cold-swaged and drawn into a 760 μm diameter wire. Sections of the wire were annealed at a temperatures between 525 and 1225 K in a hydrogen atmosphere.	Tension test L = 12.7 cm W = 760 μm	DNR
Cu	85	99.99%	Tensile specimens were machined from rods that had been cold-swaged. These specimens were annealed for 1 hr at various temperatures. A reversed torsion straining process was used to make the finest grain size specimens.	Tension test L = 3.8 cm D = 0.8 cm $\dot{\epsilon} = 8.3 \times 10^{-4} \text{ s}^{-1}$	Linear intercept
Cu	72	99.99%	As-received wires were annealed in vacuum at temperatures between 1050 K and 1250 K for times between 1 and 9 hrs.	Tension test L = 10 mm D = 2 mm $\dot{\epsilon} = 10^{-3} \text{ s}^{-1}$	Linear intercept
Cu	73	99.999%	Cu films with thicknesses between 530 and 890 μm were prepared by sputter deposition. The films grain sizes were controlled by varying the substrate temperature during deposition.	Tension test L = 950 μm w = 320 μm t = 530 to 890 μm $\dot{\epsilon} = 8.5 \times 10^{-3} \text{ s}^{-1}$	Linear intercept
Cu	71	99.999%	Wires were cold-drawn to 10 to 90% reductions in area and then recrystallized by annealing at temperatures between 575 and 675 K for 1 hr.	Tension test D = 1.4 to 4.5 mm $\dot{\epsilon} = 7 \times 10^{-4} \text{ s}^{-1}$	Areal density
Cu	70	99.98%	One set of samples was prepared by annealing as-received bars for various times at temperatures between 523 and 1037 K. Another set of samples was by cold-forging and then annealing the as-received material.	Tension test L = 3 cm D = 0.45 cm $\dot{\epsilon} = 5.6 \times 10^{-4} \text{ s}^{-1}$	DNR
Cu	86	CP Cu	3 mm thick sheet was prepared by cold-rolling. This sheet was annealed in air at 773 K for times between 2 and 1000 minutes.	Vickers hardness	Linear intercept

Cu	81	99.99%	One set of samples was prepared by cold-rolling a 2 mm diameter rod into 0.2 mm thick foil that was then annealed for 30 minutes at temperatures between 575 and 875 K. Another set of samples was prepared using high pressure torsion at room temperature. The high pressure torsion samples were annealed at temperatures between 575 and 675 K for 30 minutes. The third set of samples was prepared by consolidating nanopowders prepared by inert gas condensation. The powders were consolidated under a uniaxial pressure of 1 GPa into a 300 μm thick pellet.	Miniaturized disk bend test $\dot{\epsilon} = 10^{-3} \text{ s}^{-1}$	Linear intercept
Cu	74	99.99%	Powders prepared by inert gas condensation were warm-pressed for 10 minutes under a compaction stress of 1.4 GPa at temperatures between 305 and 455 K.	Tension test $L = 3 \text{ mm}$ $w = 2 \text{ mm}$ Vickers hardness	XRD
Cu	76	99.999%	One set of samples was prepared by magnetron sputtering Cu on to a Si substrate. Another set of samples was prepared from plates subjected to a surface mechanical attrition treatment. A third set of samples was prepared using equal channel angular extrusion in which the specimens were extruded through a 90° angle 8 times, rotating the specimen by 90° between each pass	Nanoindentation hardness	XRD
Cu	82	DNR	Foils 30 μm thick were prepared by DC electrodeposition using current densities 0.01 and 0.15 A/cm^2 .	Vickers hardness	XRD
Cu	77	99.6%	Cu powder was mechanically milled in a Fritsch Pulverisette-5 planetary mill using stearic acid, milling times between 0.5 and 30 hrs, and hardened steel media and vial. The as-milled powders were warm-consolidated using a 1.2 GPa compaction stress, a soak temperature of 703 K, and a soak time of 1 hr.	Compression test	XRD
Cu	80	99.99%	Powders prepared by inert gas condensation were consolidated under a pressure of 1.4 GPa. The compacts were then annealed in an Ar atmosphere at temperature 430 K for up to 10 hrs.	Vickers hardness	XRD
Cu	75	99.99%	Powders prepared by inert gas condensation in helium were warm-pressed under a pressure of 1.4 GPa at 381 K for 1 hr.	Compression test $h = 0.1 \text{ to } 0.45 \text{ cm}$ $D = 0.3 \text{ cm}$ $\dot{\epsilon} = 10^{-3} \text{ s}^{-1}$ Vickers hardness	XRD

Cu	79	DNR	Nanopowders synthesized by inert gas condensation were consolidated under a pressure of 1.4 GPa.	Tension test L = 0.32 cm w = 0.14 cm t = 180 μm $\dot{\epsilon} = 10^{-5} \text{ s}^{-1}$ Vickers hardness	XRD
Cu	83	DNR	Nanopowders synthesized using wet chemistry were consolidated using a uniaxial hot press. The compaction pressure was 100 MPa, the soak time was 1 or 2 hrs, and the soak temperature ranged from 925 to 1025 K.	Vickers hardness	XRD
Cu	84	Si wt% = 1.5	Samples were processed by high pressure torsion, using up to 5 revolutions and a confining pressure of 5 GPa.	Vickers hardness	XRD
Cu	69	DNR	Specimens were machined from rods that had been cold-swaged to a 75% reduction in area. Specimens were recrystallized by annealing for 1 hr in molten salt.	Tension test	DNR
Ag	88	DNR	Nanopowders synthesized by inert gas condensation were consolidated under a pressure of 2.3 GPa using soak temperatures between 325 and 675 K and a soak time of 30 minutes.	Vickers hardness	XRD
Ag	89	99.99%	Nanopowders synthesized by inert gas condensation were consolidated under a pressure of 1.3 GPa using soak temperatures between 510 and 990 K.	Vickers hardness	XRD
Ag	91	99.99%	Nanopowders synthesized by inert gas condensation were cold-pressed in argon and then sintered at temperatures between 475 and 1075 K for 30 minutes in a vacuum of 10^{-4} torr.	Vickers hardness	Circular equivalent diameter
Ag	87	99.9%	As-received cold-worked strip was annealed in air for 30 minutes at temperatures between 375 and 1175 K.	Tension test L = 3.81 cm w = 1.27 cm t = 0.145 mm $\dot{\epsilon} = 7 \times 10^{-4} \text{ s}^{-1}$	Linear intercept
Ag	90	99.97%	Silver wires were drawn at room temperature from an initial diameter of 1.5 mm to a final diameter of 500 μm . The wires were annealed at temperatures between 975 and 1175 K for 30 minutes.	Tension test L = 12.7 cm w = 500 μm	DNR
Au	92	99.99%	20 to 25 μm thick films were RF magnetron sputtered in an argon atmosphere onto Ni coupons. The grain size was varied by controlling the substrate temperature during deposition.	Vickers hardness	Linear intercept

Au	93	99.99%	Nanopowders synthesized by inert gas condensation were spray consolidated onto a glass substrate	Vickers hardness	XRD
Au	94	99.99%	Films with thickness between 0.2 and 2.1 μm were deposited on a silicon substrate using electron beam and thermal evaporation. The silicon substrate was etched away and then the films were then annealed at 1075 K for 1 minute.	Tension test L = 4 mm w = 1 mm t = 2.1 μm $\dot{\epsilon} = 6 \times 10^{-5} \text{ s}^{-1}$	Circular equivalent diameter
Au	95	99.99%	Films with thicknesses between 0.25 to 1 μm were deposited on a silicon substrate using electron beam evaporation. The silicon substrate was etched away after deposition.	Tension test L = 300 μm w = 10 μm t = 1 μm $\dot{\epsilon} = 10^{-6} \text{ to } 10^{-4} \text{ s}^{-1}$	Linear intercept
Ni	96	99.99%	A cast ingot was rough-forged and hot-rolled at 1325 K into bar stock that was then cold-rolled to a 50% reduction in area. This material was annealed for 1 hr at temperatures between 1090 and 1425 K.	Tension test L = 3.18 cm D = 0.64 cm $\dot{\epsilon} = 10^{-5} \text{ s}^{-1}$	Linear intercept
Ni	98	99.9%	5 cm diameter ingots were hot-rolled into 1.27 cm thick plates that were recrystallized by annealing in evacuated quartz tubes at 1275 K for 75 to 900 s.	Tension test L = 2.5 cm D = 3 mm $\dot{\epsilon} = 8 \times 10^{-5} \text{ s}^{-1}$	DNR
Ni	99	99.99%	Ni rods were preheated to 475 K then drawn.	Tension test L = 2.5 cm D = 6 mm $\dot{\epsilon} = 2 \times 10^{-4} \text{ s}^{-1}$	DNR
Ni	100	99.9%	8 mm thick films were DC electroplated from a high purity sulfamate bath held at 320 K. Samples were also prepared by swaging a 2 cm diameter ingot to a 50% reduction in area. These samples were annealed in either a salt bath or helium atmosphere at temperatures up to 675 K.	Tension test L = 2.5 cm D = 0.3 cm $\dot{\epsilon} = 8 \times 10^{-4} \text{ s}^{-1}$	Linear intercept
Ni	101	DNR	Films were DC electroplated at room temperature using a current density of 0.01 A/cm ²	Vickers hardness	Linear intercept
Ni	102	99.9%	Ni films 300 μm thick were DC electroplated onto a Ti substrate using a modified Watt's bath. The substrate was etched away after deposition.	Vickers hardness	Circular equivalent diameter
Ni	103	DNR	Ni films 30 μm thick were electroplated onto a copper substrate using a current density of 0.018 A/cm ² . The crystallite size was controlled by changing the plating solution's pH.	Tension test L = 1.2 cm t = 30 μm $\dot{\epsilon} = 2 \times 10^{-4} \text{ s}^{-1}$ Vickers hardness	XRD

Ni	106	DNR	Nickel films were electrodeposited on a copper substrate in a bath held at 340 K using a current density of 0.05 A/cm ² .	Nanoindentation hardness	XRD
Ni	107	DNR	50 to 700 nm thick nickel films were grown on a silicon substrate using pulsed laser deposition. The deposition chamber was under a vacuum of 10 ⁻⁷ torr during deposition, and the substrate temperature was varied between room temperature and 550 K.	Nanoindentation hardness	Circular equivalent diameter
Ni	105	99.9%	Nickel films 50 µm thick were electrodeposited onto a nickel substrate using a sulfamate bath without additives.	Vickers hardness	XRD
Ni	104	99.98%	Test specimens were cut from plates that had been cold-rolled to a 90% reduction in area and annealed.	Tension test	DNR
Ni	97	99.98%	3.7 mm diameter rods were swaged into 1.8 mm diameter wire that was cut into specimens and annealed for 1 hr at temperatures ranging from 1025 to 1325 K.	Tension test L = 2.5 cm $\dot{\epsilon} = 8 \times 10^{-4} \text{ s}^{-1}$	Linear intercept
Al	8	99.9%	Samples were cut from wire that had been cold-drawn to over 90% reduction in area and annealed at various temperatures.	Tension test $\dot{\epsilon} = 3 \times 10^{-4} \text{ s}^{-1}$	DNR
Al	109	99.99%	As-received sheets were annealed at 846 K.	Tension test L = 7 cm w = 1 cm t = 0.1 cm $\dot{\epsilon} = 2 \times 10^{-4} \text{ s}^{-1}$	Linear intercept
Al	108	99.99%	Wires were cold-rolled and drawn to an 80% reduction in area. The wires were then recrystallized by annealing at 573 to 773 K for 1 hr.	Tension test D = 0.32 to 1.8 cm $\dot{\epsilon} = 7 \times 10^{-5} \text{ s}^{-1}$	Mean Feret diameter
Al	113	99.9%	Aluminum powder was mechanically milled in a SPEX 8000 ball mill using a ball-to-powder ratio of 4:1. The powders were milled for times between 2 and 32 hrs. The as-milled powder was cold-pressed into a disc under a pressure of 1 GPa.	Tension test L = 1.5 cm D = 0.5 cm $\dot{\epsilon} = 10^{-4} \text{ s}^{-1}$	XRD
Al	114	99%	Sheets 1 mm thick were subjected to 6 cycles of accumulative roll bonding, receiving a 50% reduction in area in each pass. The sheets were annealed at temperatures between 373 and 673 K for times between 10 and 30 minutes.	Tension test L = 1.0 cm t = 0.5 cm $\dot{\epsilon} = 8.3 \times 10^{-4} \text{ s}^{-1}$	Linear intercept
Al	115	99%	Samples were prepared using equal channel angular extrusion.	Vickers hardness	Linear intercept
Al	116	99.9%	Aluminum powder was cryo-milled in an attrition mill, degassed, and then HIP'ed at temperatures between 548 and 623 K using pressures of 103 to 172 MPa. The HIP'ed	Tension test L = 1.8 cm D = 0.45 cm	Circular equivalent diameter

			compacts were heated to 523 K and extruded to a 90% reduction in area.	$\dot{\epsilon} = 1 \times 10^{-3} \text{ s}^{-1}$	
Al	117	99%	Samples were prepared using equal channel angular extrusion. The specimens were extruded through a 90° angle 8 times, and were rotated 90° between each pass. The samples were annealed at various temperatures to alter the grain size.	Tension test L = 1.4 cm D = 0.3 cm $\dot{\epsilon} = 7.1 \times 10^{-4} \text{ s}^{-1}$	Circular equivalent diameter
Al	122	99%	Samples were prepared using equal channel angular extrusion. The specimens were extruded a 90° angle 8 times, and were rotated by 90° between each pass. These samples were annealed under vacuum at various temperatures between 473 and 673 K for times between 1 and 24 hrs.	Compression test h = 0.5 cm D = 0.4 cm	XRD
Al	118	99.5%	Aluminum powders were mechanically milled in a Fritsch Pulverisette-5 planetary ball mill. The grain size was controlled by varying the milling time. The as-milled powder was hot-pressed in air using a soak temperature of 900 K and a soak time of 1 hr.	Compression test h = 0.8 cm D = 0.96 cm $\dot{\epsilon} = 10^{-4} \text{ s}^{-1}$	Circular equivalent diameter
Al	120	99.9%	Aluminum powder was cryo-milled in an attritor mill. The as-milled powder was HIP'ed under a pressure of 103 MPa using soak temperatures between 694 and 794 K. The hot-pressed compacts were extruded through a die.	Tension test L = 1.6 cm D = 0.4 cm $\dot{\epsilon} = 10^{-3} \text{ s}^{-1}$	DNR
Al	110	99.5%	Samples were machined from extruded rod that had been annealed at temperatures ranging from 775 to 900 K	Tension test D = 4.5 mm $\dot{\epsilon} = 10^{-5} \text{ s}^{-1}$	Linear intercept
Al	111	99.7%	Samples were prepared from cold-drawn and hydrostatic extruded specimens. The samples were annealed for 1 hr at temperatures between 550 and 700 K.	Tension test $\dot{\epsilon} = 10^{-4} \text{ s}^{-1}$	DNR
Al	119	99.5%	Aluminum powder was mechanically milled using a planetary ball mill. The as-milled powder was hot-pressed under a uniaxial pressure of 900 MPa for 1 hr at 875 K.	Compression test h = 9.5 mm D = 7.6 mm $\dot{\epsilon} = 10^{-4} \text{ s}^{-1}$	XRD
Al	112	99.98%	Samples were machined from plate that had been cold-rolled and annealed at 600 K.	Tension test L = 70.5 mm w = 12.5 mm t = 3 mm $\dot{\epsilon} = 4 \times 10^{-4} \text{ s}^{-1}$	DNR
Al	121	99.987%	Samples cut from cold-drawn wire with a diameter of 700 μm were annealed for 1 hr at temperatures between 575 and 775 K.	Tension test L = 12 cm D = 700 μm $\dot{\epsilon} = 6 \times 10^{-4} \text{ s}^{-1}$	DNR

V	12	O ₂ , wt% = 0.17 N ₂ = 0.008 H ₂ < 0.0005 C = 0.017	A 6.35 mm diameter rod was rolled and swaged into 1 mm wire, which was then annealed.	Tension test L = 4.5 cm D = 0.1 cm $\dot{\epsilon} = 1.45 \times 10^{-4} \text{ s}^{-1}$	Areal density
V	16	O = 600 ppm N = 70 H = 22 C = 150	As-received wire was annealed by resistive heating in a dynamic vacuum of 10^{-5} torr.	Tension test D = 1 mm $\dot{\epsilon} = 5.5 \times 10^{-5} \text{ s}^{-1}$ Vickers hardness	Linear intercept
V	13	O = 540 ppm C = 140 N = 99 H = 9	25 to 325 μm thick films were electron beam deposited on a heated substrate.	Tension test L = 2.5 cm D = 6.5 cm t = 25 to 325 μm $\dot{\epsilon} = 10^{-4} \text{ s}^{-1}$	Linear intercept
V	15	99.8%	As-received rods were processed by equal change angular extrusion using 8 passes through a 90° angle and rotating the specimen by 90° between passes. The rods were then cooled to 77 K and rolled to a 60% reduction in area. The rolled sheets were annealed at 1125 K for times between 10 and 300 s in a salt bath.	Tension test L = 1.3 cm D = 3 mm $\dot{\epsilon} = 5 \times 10^{-4} \text{ s}^{-1}$	DNR
V	14	99.99%	10 to 50 μm thick foils were deposited onto a muscovite substrate using electron-beam deposition and magnetron sputtering. The foils were sealed in evacuated quartz ampoules and annealed.	Tension test L = 1 cm w = 0.33 cm t = 10 to 50 μm $\dot{\epsilon} = 10^{-4} \text{ s}^{-1}$ Vickers hardness	Linear intercept
V	18	99.5%	Powders were mechanically milled in a SPEX high energy ball mill. The as-milled powders were consolidated by hot-pressing under a pressure of 850 MPa using a soak time of 3 hrs and a soak temperature of 875 K.	Compression test h = 3 mm w = 2 mm $\dot{\epsilon} = 10^{-4} \text{ s}^{-1}$	Circular equivalent diameter
V	17	O = 323 ppm N = 74 H = 3 C = 100	1.9 cm diameter ingot was cold-swaged into a 2.5 mm diameter wire that was wrapped in tantalum foil and annealed in a dynamic vacuum of 10^{-7} torr.	Tension test L = 2.54 cm D = 0.2 cm $\dot{\epsilon} = 8 \times 10^{-5} \text{ s}^{-1}$	Linear intercept
Nb	27	O = 120 ppm N = 13	A 6.35 mm diameter rod was rolled and swaged into 1.25 mm diameter wire. The wires were wrapped in sacrificial tantalum foil and annealed.	Tension test L = 7.5 cm D = 1.25 cm $\dot{\epsilon} = 1.3 \times 10^{-4} \text{ s}^{-1}$	Linear intercept

Nb	19	O = 550 ppm N = 120	750 μm diameter wires were annealed for 60 minutes at temperatures ranging from 1175 to 1825 K.	Tension test L = 5 cm D = 750 μm $\dot{\epsilon} = 5 \times 10^{-4} \text{ s}^{-1}$	Linear intercept
Nb	29	O = 60 ppm N = 45	As-received cold-rolled foil was resistively heated to temperatures between 1295 and 1675 K in a vacuum of 10^{-6} torr.	Tension test L = 2.5 cm D = 1.2 cm $\dot{\epsilon} = 3 \times 10^{-4} \text{ s}^{-1}$	Linear intercept
Nb	21, 22, 28	99.99%	Disks 10 mm in diameter were processed by high pressure torsion at ambient temperature. The disks were then annealed for 2 hrs at temperatures between 675 and 1075 K.	Vickers hardness	Circular equivalent diameter
Nb	20	O = 400 ppm N = 100	As-received wires were annealed in vacuum at temperatures in the range 1475-2275 K.	Tension test $\dot{\epsilon} = 10^{-3} \text{ s}^{-1}$	DNR
Nb	23	O = 185 ppm N = 57	Test specimens were machined from as-received rod stock and annealed at temperatures between 1375 and 1775 K.	Tension test L = 1.8 cm D = 0.45 cm $\dot{\epsilon} = 1.5 \times 10^{-3} \text{ s}^{-1}$	Areal density
Nb	24	O = 200 ppm N = 200	A 1.27 mm diameter rod was annealed at 1400 K for 1 hr.	Tension test L = 2.54 cm D = 0.55 cm $\dot{\epsilon} = 5 \times 10^{-3} \text{ s}^{-1}$	DNR
Nb	25	O wt% = 0.01 N = 0.08 C = 0.07	Wires with a 1 mm diameter were annealed at temperatures between 1350 and 1690 K for 1 or 2 hrs.	Tension test L = 7.5 cm D = 0.1 cm $\dot{\epsilon} = 2 \times 10^{-4} \text{ s}^{-1}$	DNR
Nb	26	O = 340 ppm N = 140 H = 14	As-received rods were annealed in a vacuum furnace at temperatures between 1375 and 2575 K.	Tension test L = 1.9 cm D = 0.25 cm $\dot{\epsilon} = 8.8 \times 10^{-5} \text{ s}^{-1}$	Linear intercept
Ta	32	O ₂ = 150 ppm N ₂ = 100 H ₂ = 2 C = 50	A 7.62 cm dia ingot was rolled and swaged into a 0.3 cm rod. The rods were then annealed using an electron beam heating source at temperatures between 1695 and 2345 K under a dynamic vacuum of 10^{-5} torr.	Tension test L = 2.5 cm D = 0.3 cm $\dot{\epsilon} = 10^{-3} \text{ s}^{-1}$	DNR
Ta	31	O ₂ = 20 ppm N ₂ = 12 H ₂ = 10 C = 40	As-received rods made using powder metallurgy were annealed at temperatures between 1775 and 2975 K for 1 hr under a vacuum of 10^{-5} torr.	Tension test L = 2 cm D = 0.3 cm $\dot{\epsilon} = 5 \times 10^{-4} \text{ s}^{-1}$	Linear intercept
Ta	33, 34	99.98%	Rods were processed by equal channel angular extrusion, using 1 to 4 passes through a 90° angle, rotating the	Vickers hardness	Linear intercept

			specimen by 90° between passes. The rods were then annealed at 1645 K for various times.		
Ta	35	99.95%	1 µm thick films were RF magnetron sputtered onto a glass substrate.	Nanoindentation hardness	XRD
Ta	37	DNR	100 to 200 nm thick films were electron beam evaporated onto a silicon substrate.	Nanoindentation hardness	Atomic force microscopy
Ta	36	DNR	Ta thin films were deposited onto silicon substrates using direct-current magnetron sputtering.	Nanoindentation hardness	XRD
Ta	14, 30	99.99%	10 to 50 µm thick foils were deposited onto a muscovite substrate using electron-beam deposition and magnetron sputtering. The foils were sealed in evacuated quartz ampoules and annealed.	Tension test L = 1 cm w = 0.33 cm t = 10 to 50 µm $\dot{\epsilon} = 10^{-4} \text{ s}^{-1}$ Vickers hardness	Linear intercept
Cr	60	DNR	Rods were prepared by electrodeposition.	Vickers hardness	DNR
Cr	57	99.7%	A disk was processed by high pressure torsion, and then annealed at various temperatures.	Vickers hardness	Circular equivalent diameter
Cr	59	DNR	Ingots were swaged down to 6.8 cm dia rods. The rods were sealed in evacuated quartz ampoules and annealed at temperatures between 1235 and 1875 K for 1/2 to 2 hrs.	Compression test h = 1 cm D = 0.5 cm $\dot{\epsilon} = 10^{-4} \text{ s}^{-1}$	DNR
Cr	58	DNR	A 100 µm thick film was electrodeposited using a modified "Sargent" bath. Films were annealed in air for 1 hr at temperatures between 625 and 875.	Nanoindentation hardness	XRD
Mo	62	C = 160 ppm N = 185 O = 70 H = 4	A 4.1 cm diameter ingot was rolled and swaged into a 6 mm diameter rod. Specimens machined from the rod were annealed for various times at 1673 K.	Tension test L = 1.9 cm D = 2.5 mm $\dot{\epsilon} = 9 \times 10^{-4} \text{ s}^{-1}$	Linear intercept
Mo	61	C, wt% = 0.008 N = 0.003 O < 0.001	A 10 cm diameter ingot was rolled and swaged into a 6 mm diameter rod that was machined into tensile specimens. These specimens were annealed for various times at 1673 K in a hydrogen atmosphere.	Tension test L = 1.9 cm D = 2.5 mm $\dot{\epsilon} = 2 \times 10^{-3} \text{ s}^{-1}$	Linear intercept
Mo	64	CP Mo O = 10 ppm C = 20 N = 10	As-received rods with a diameter of 2.5 mm were annealed at temperatures between 1075 to 1925 K for 30 minutes in a vacuum of 2×10^{-6} torr.	Tension test L = 5 cm D = 2.5 mm $\dot{\epsilon} = 10^{-4} \text{ s}^{-1}$ Vickers hardness	DNR

Mo	63	C = 70 ppm O = 750 N = 25 H = 23	25 to 325 μm thick films were electron-beam deposited on a heated substrate.	Tension test L = 2.5 cm w = 0.65 cm t = 25 to 325 μm $\dot{\epsilon} = 10^{-4} \text{ s}^{-1}$	Linear intercept
Mo	65	DNR	0.35 to 1.5 μm thick films were deposited onto a silicon substrate using electron-beam evaporation and steered arc deposition.	Nnaoindentation hardness	Linear intercept
Mo	66	C = 330 ppm N < 10 O = 6	A 1.14 cm diameter bar was hot- and cold-worked into a 6 mm diameter rod that was subsequently annealed at temperatures between 1595 and 2365 K for 30 minutes.	Tension test L = 1.27 cm D = 0.32 cm $\dot{\epsilon} = 7 \times 10^{-4} \text{ s}^{-1}$	Linear intercept
W	68	99.5%	Nanopowders were consolidated at temperatures between 1095 and 1245 K under a pressure of 1 GPa.	Vickers hardness	Circular equivalent diameter
W	67	CP W	Wires with a 760 μm diameter were drawn at temperatures between 1075 and 1675 K. The wires were then annealed under vacuum for 10 to 30 minutes at temperatures between 975 and 2275 K.	Tension test	Circular equivalent diameter
Fe	50	C, wt% = 0.013 N = 0.0076 O = 0.07	3 mm diameter rods were prepared by wire-drawing 5 mm diameter rods. The specimens were annealed at temperatures between 975 and 1475 K.	Tension test $\dot{\epsilon} = 10^{-4} \text{ s}^{-1}$	Linear intercept
Fe	42	C, wt% = 0.02 S = 0.02 P = 0.024 N = 0.003	Specimens were annealed at temperatures up to 1325 K for times up to 24 hrs.	Tension test L = 2.5 cm D = 3 mm $\dot{\epsilon} = 10^{-4} \text{ s}^{-1}$	DNR
Fe	43	C, wt% = 0.15 S = 0.05 P = 0.03 N = 0.008	DNR	Tension test L = 2.5 cm D = 3 mm $\dot{\epsilon} = 10^{-4} \text{ s}^{-1}$	DNR
Fe	49	C, wt% = 0.03 S = 0.03 P = 0.007	7 mm diameter rod was cold swaged and drawn to 1 mm diameter wires. The samples were annealed at 1073 K.	Tension test L = 7.5 cm D = 1 mm $\dot{\epsilon} = 10^{-4} \text{ s}^{-1}$	Areal density
Fe	41	C, wt% = 0.014 N = 0.003 O = 0.005 P = 0.003 S = 0.011	Wire with a 1.6 mm diameter was prepared by cold swaging a 12.5 mm diameter rod.	Tension test L = 6 cm D = 1.3 mm $\dot{\epsilon} = 6 \times 10^{-4} \text{ s}^{-1}$	DNR
Fe	44	C, wt% = 0.11 S = 0.05	DNR	Tension test $\dot{\epsilon} = 10^{-4} \text{ s}^{-1}$	DNR

		P = 0.029 N = 0.0085			
Fe	45	C, wt% = 0.014 N = 0.003 O = 0.005 Si = 0.06 P = 0.003 S = 0.011	A 1.25 cm diameter rod was cold-swaged into 1.6 mm diameter wire. Tensile specimens cut from the wire were then sealed in evacuated quartz tubes annealed at temperatures between 995 and 1195 K.	Tension test L = 6 cm D = 0.13 cm $\dot{\epsilon} = 7 \times 10^{-4} \text{ s}^{-1}$	DNR
Fe	40	C, wt% = 0.03 P = 0.014 S = 0.016	Tensile specimens were strained to various degrees and then annealed in a hydrogen atmosphere at 1123 K.	Tension test L = 7 cm D = 0.13 cm $\dot{\epsilon} = 1 \times 10^{-2} \text{ s}^{-1}$	DNR
Fe	38	C, wt% = 0.004 N = 0.003	Iron plate was cold-rolled to an 80% reduction in area. The as-rolled sheets were then annealed under vacuum for 1 to 36 hrs at temperatures between 975 and 1165 K.	Tension test L = 4 cm w = 1 cm t = 0.5 to 8 mm $\dot{\epsilon} = 5 \times 10^{-5} \text{ s}^{-1}$	DNR
Fe	55	C, wt% = 0.005 P = 0.002 S = 0.006 N = 0.0004	Specimens were cut from cold-rolled sheet that was annealed for 30 minutes at 825 K.	Tension test L = 2.5 cm w = 6 mm t = 0.6 mm $\dot{\epsilon} = 5 \times 10^{-4} \text{ s}^{-1}$	Linear intercept
Fe	39	C, wt% = 0.002 N = 0.005 O = 0.034 P = 0.011 S = 0.007	Iron plate was rolled to 10 to 40% reductions in area. The plates were then annealed at temperatures between 875 and 975 K for times between 1 and 25 hrs.	Tension test L = 1.25 cm D = 0.6 cm $\dot{\epsilon} = 10^{-4} \text{ s}^{-1}$	Linear intercept
Fe	46	DNR	Iron powder was milled in a SPEX high energy ball mill using steel media and vial and a ball-to-powder ratio of 10:1. The powder was then mounted in epoxy and cross-sectioned.	Vickers hardness	XRD
Fe	47	99.9%	Iron powder was mechanically milled in a SPEX ball mill using steel media and vial, and a ball to powder ratio of 10:1. The as-milled powder was warm-pressed using a uniaxial press under a 2.8 GPa stress at temperatures between 293 and 758 K. The grain size was varied by annealing the compacts at 800 K for various times under a dynamic vacuum of 2×10^{-6} torr.	Vickers hardness	XRD
Fe	48	99.9%	Iron powder was mechanically milled in a planetary ball mill and then cold-pressed into a pellet.	Nanoindentation hardness	XRD

Fe	51	C, wt% = 0.025 N = 0.0003	Cast ingots were hot-rolled, cold-swaged, and finally drawn to wires.	Tension test L = 12.7 cm D = 0.7 mm $\dot{\epsilon} = 10^{-5} \text{ s}^{-1}$	Linear intercept
Fe	52	C, wt% = 0.15 S = 0.051 P = 0.026 N = 0.01	Specimens machined from bar stock were annealed at various temperatures.	Tension test L = 2.5 cm D = 3 mm $\dot{\epsilon} = 10^{-4} \text{ s}^{-1}$	DNR
Fe	53	99.9%	Powders were mechanically milled in SPEX 8000 high energy ball mill. The grain size was varied by annealing the powders for various times.	Vickers hardness	XRD
Fe	54	99.9%	Iron films with thickness between 1 and 1.2 μm were deposited on glass substrate.	Nanoindentation hardness	XRD
Fe	56	C, wt% = 0.002 N = 0.0027 P = 0.005 S = 0.006	Samples were prepared by accumulative roll bonding of 2 mm thick iron sheets.	Tension test L = 10 mm D = 5 mm $\dot{\epsilon} = 8 \times 10^{-4} \text{ s}^{-1}$	Linear intercept