**L1. The Microstructure of Materials**

*Using the given information, identify the microconstituents of the following metals.*

*Justify you answer.*

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|  | **Pure iron (99.9%Fe, 0.1%impurities). Annealed.**  **Microconstituents:** Ferrite (alpha-Fe)  Pure iron+room temperature=> BCC structure=> ferrite (single phase solid solution) |
| G:\New folder\0012.jpg | **Bronze (alloy 95%Cu + 5%Sn). As cast.**  **Microconstituents:** alpha-phase (solid solution of Sn in Cu) = eutectoid structure  As cast + bronzed => dendritic alpha-phase grains |
|  | **Brass (alloy 70%Cu + 30%Zn). Annealed.**  **Microconstituents:** alpha-Brass (solid solution of Zn in Cu)  Single-phase FCC and annealing twins (recrystallization) |
| 6 | **Carbon steel (99.98%Fe+0.02%C). Annealed.**  **Microconstituents:** Ferrite  Very low C content => ferrite  BCC solution of C in Fe |
| D:\Depozitare\FINALIZATE\Lucru_dobri\optic\aliaje ti rc 30-03-22\41-4.tif | **Titanium alloy (TiTaZrNbAg). As cast.**  **Microconstituents:** complex solid solution and intermetallics  Multi-elements => different phases but mainly solid solution strengthening |
| D:\Depozitare\LICENTE\2022\Licente+dizertatii2022\Asanache\micrografii\WIN_20220504_134358.JPG | **White cast iron (4.5%C+rest Fe). As cast.**  **Microconstituents:** cementite + pearlite/ledeburite  White cast has cementite (hard & brittle) and an eutectic mix of austenite and cementite |
| D:\Depozitare\LICENTE\2022\Licente+dizertatii2022\Asanache\micrografii\WIN_20220504_134810.JPG | **Steel (0.6%C + rest Fe). Annealed.**  **Microconstituents:** pearlite and ferrite  Ferrite grains |
| D:\Depozitare\LICENTE\2022\Licente+dizertatii2022\Asanache\micrografii\WIN_20220504_133415.JPG | **Steel (0.8%C + rest Fe). Annealed.**  **Microconstituents:** pearlite  Eutectoid steel => pearlite (fine mix of ferrite & cementite) |
| 22 | **Stainless steel (18%Cr+8%Ni+4%Mo+rest Fe). Annealed.**  **Microconstituents:** austenite  Austenitic stainless steel (FCC) stabilized by Ni & Cr |