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Nota di contenuto	CONTENTS; Foreword; Chapter 1: Metallic, Complex and So Different Jean-Marie Dubois; 1. Introduction; 2. Historical Background; 3. Complexity in Real and Reciprocal Space; 3.1. The example of compounds of Al, Mg and Zn; 3.2. Hierarchy, groups of atoms and clusters; 3.3. The key role played by disorder and defects; 3.4. Definition of a CMA in reciprocal space; 4. Metallurgy and Surface Chemistry of CMAs; 4.1. Preparation methods; 4.2. Corrosion, oxidation and interaction with chemical atmosphere; 4.3. Atom transport; 4.4. Essential mechanical properties; 4.5. Metadislocations 5. Phase Selection 5.1. Hume-Rothery rules; 5.2. More on specific Al-TM CMAs; 5.3. The case of g-brass type CMAs; 5.4. The case of Al-Mg (-Zn) alloys; 5.4.1. Locating d-like states in Al-TM based alloys; 5.4.2. Alloys based on Al, Mg, and possibly containing Zn; 5.4.3. A supplementary mechanism for phase selection and stability?; 6. Properties of Al-Transition Metal(s) CMAs; 6.1. The essential property of Al-TM CMAs; 6.2. Transport properties; 6.3. Solid-solid contact; 6.3.1. Fretting; 6.3.2. Friction anisotropy; 6.3.3. Surface energy; 6.4. Wetting against liquid metals 6.5. Wetting against polar liquids7. Inverse Nano-Structuration; 8.

Sommario/riassunto

Complex metal alloys (CMAs) comprise a huge group of largely unknown alloys and compounds, where many phases are formed with crystal structures based on giant unit cells containing atom clusters, ranging from tens of to more than thousand atoms per unit cell. In these phases, for many phenomena, the physical length scales are substantially smaller than the unit-cell dimension. Hence, these materials offer unique combinations of properties which are mutually exclusive in conventional materials, such as metallic electric conductivity combined with low thermal conductivity, good light absorption