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Foreword

This translation has been made based on the original Japanese Industrial Standard revised by the Minister of Economy, Trade and Industry through deliberations at the Japanese Industrial Standards Committee as the result of proposal for revision of Japanese Industrial Standard submitted by The Foundation of Osaka Science & Technology Center (OSTEC)/Japanese Standards Association (JSA) with the draft being attached, based on the provision of Article 12 Clause 1 of the Industrial Standardization Law applicable to the case of revision by the provision of Article 14.

Consequently **JIS H 7003**:1989 is replaced with this Standard.

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Glossary of terms used in hydrogen absorbing alloys

1 Scope

This Japanese Industrial Standard specifies the principal terms and definitions relating to hydrogen absorbing alloys and their applications (hereafter referred to as “terms”).

2 Classification

The terms shall be classified as follows.

- a) Materials and working methods
- b) Phenomena, physical properties, and structure
- c) Measuring methods
- d) Applications

3 Terms and definitions

The terms and definitions shall be as follows.

a) **Materials and working methods**

No.	Term (Japanese character)	Reading	Definition	English equivalent (informative)
1001	水素吸蔵合金	SUIISO KYŪZŌ GŌKIN	an alloy which is quick in absorption and desorption reaction of hydrogen and high in its reversibility under the condition to be used among the alloys producing metal hydride NOTE: It is also referred to as “SUIISO TYOZŌ GŌKIN”. Generally metallic bond type hydrides are often indicated, which are alloys of a metal of strong affinity for hydrogen and a metal of weak affinity for hydrogen. This alloy stores a great amount of hydrogen, and the hydrogen is desorbed by heating or reduction of pressure and is absorbed by cooling or pressurization. Its desorption and absorption are reversible and its reaction speed is quick.	hydrogen absorbing alloys, hydrogen storage alloys
1002	金属水素化物	KINZOKU SUIISO KABUTU	the generic name for compounds of metal element and hydrogen Metallic bond type hydride is classified into metallic hydride, covalent bond type hydride, and ionic bond type hydride. NOTE: Metal hydrides can be represented by the letters MH.	metal hydride, MH
1003	金属結合型水素化物	KINZOKU KETUGŌ GATA SUIISO KABUTU	a metal hydride having metallic properties NOTE: Principal hydrogen absorbing alloys belong to this type. Nonstoichiometric hydrides such as $\text{LaNi}_5\text{H}_{6.6}$ and $\text{TiFeH}_{1.9}$ are generated. Structure of metal lattice does not basically vary even of hydrogenation, and lattice distance simply increases.	metallic hydride
1004	共有結合型水素化物	KYŌYŪ KETUGŌ GATA SUIISO KABUTU	a metal hydride having the property of covalent bond in the bond of metal and hydrogen NOTE: Absorption of infrared rays based on covalent bond MH stretching vibration is observed, and activation energy of hydrogenation and dehydrogenation reaction is large. SiH_4 for a molecular state, AlH_3 for a polymer state, and NaBH_4 , LiAlH_4 , etc. for hydride complex are well known.	covalent hydride

No.	Term (Japanese character)	Reading	Definition	English equivalent (informative)
1005	イオン結合型水素化物	ION KETUGÔ GATA SUIISO KABUTU	a metal hydride having the property of ionic bond in the bond of metal and hydrogen NOTE: It is also called "ION GATA SUIISO KABUTU" or "ENGATA SUIISO KABUTU". In this compound, metal is an anion and hydrogen is a cation. Its melt shows high conductivity. When electrolyzed, hydrogen is generated on the anode side. Further, metal is contracted by hydrogenation and large generation of heat follows hydrogenation reaction. Many of the hydrides having alkali metal as principal component belong to this type.	ionic hydride
1006	錯体系水素化物	SAKUTAI KEI SUIISO KABUTU	a hydride forming especially a complex among covalent hydrides NOTE: The imide-amide based compounds, alanate and magnesium compounds consisting primarily of lithium, sodium, aluminium, etc. are included. Many of these hydrides are accompanied by phase separation • bonding at the time of hydrogenation • dehydrogenation and there are many hydrides which are comparatively slow in reaction velocity but light in weight.	complex hydride
1007	アモルファス水素吸蔵合金	AMORUHASU SUIISO KYÛZÔ GÔKIN	an amorphous hydrogen absorbing alloy NOTE: It is also referred to as "SUIISO KYÛZÔ AMORUHASU GÔKIN" or "HISYÔSITU SUIISO KYÛZÔ GÔKIN". Principally group IVa transition metals which have strong affinity for hydrogen are joined by other metals such as Cu and Ni and are obtained by quenching, by vapour deposition method, sputtering method, or other rapid solidification process. Ti-Cu system, Ti-Ni system, Zr-Ni system, La-Ni system, etc. are known, of which a pressure-composition diagram has no plateau area. Volume expansion by hydrogen absorption is comparatively small.	hydrogen absorbing amorphous alloys

No.	Term (Japanese character)	Reading	Definition	English equivalent (informative)
1008	ミッシュュメタル	MISSYU METARU	a mixture of rare earth metals NOTE: It contains Ce, La, Pr, Nd, etc. It can be used as the mixture of rare earth metals as it is instead of La-Ni system La without extraction and refining to a simple element. The components can be different a little depending on the production area. It is sometimes marked as Mm.	mischmetal, mishmetal
1009	カルシウム系水素吸蔵合金	KARUSIUMU KEI SUIISO KYÛZÔ GÔKIN	an alloy having Ca of strong affinity for hydrogen and other transition metals as principal components NOTE: They are also called "KARUSIUMU KI SUIISO KYÛZÔ GÔKIN" or "KARUSIUMU KI GÔKIN". CaNi ₅ is a representative. A same AB ₅ type hexagonal structure alloy as LaNi ₅ is well known.	calcium based hydrogen absorbing alloys
1010	希土類水素吸蔵合金	KIDO RUI KEI SUIISO KYÛZÔ GÔKIN	an alloy consisting primarily of rare earths such as La, Ce of strong affinity for hydrogen and other transition metals NOTE: They are also called "KIDO RUI GÔKIN". An AB ₅ type alloy of a hexagonal structure such as LaNi ₅ and MmNi ₅ is well known.	rare earth based hydrogen absorbing alloys
1011	マグネシウム系水素吸蔵合金	MAGUNESIUMU KEI SUIISO KYÛZÔ GÔKIN	an alloy consisting primarily of Mg of strong affinity for hydrogen NOTE: They are also called "MAGUNESIUMU KI GÔKIN". A hydrogen absorption amount per unit mass is large, and it belongs in a high temperature hydride.	magnesium based hydrogen absorbing alloys
1012	チタン系水素吸蔵合金	TITAN KEI SUIISO KYÛZÔ GÔKIN	an alloy consisting primarily of Ti of strong affinity for hydrogen and other transition metals NOTE: They are also called "TITAN KI GÔKIN" or "TITANIUMU KEI GÔKIN". There are a Ti-Fe system of CsCl type, Ti-Ni system, Ti-Mn system of Laves phase, and Ti-V alloys of BCC structure, etc.	titanium based hydrogen absorbing alloys

No.	Term (Japanese character)	Reading	Definition	English equivalent (informative)
1013	ジルコニウム系水素吸蔵合金	ZIRUKONIUMU KEI SUIISO KYÛZÔ GÔKIN	an alloy consisting primarily of Zr of strong affinity for hydrogen and other transition metals NOTE: They are also called “ZIRUKONIUMU KI SUIISO KYÛZÔ GÔKIN”, “ZIRUKONIUMU KI GÔKIN” or “ZIRUKONIUMU KEI GÔKIN”. There are Zr-Mn system of Laves phase or the like.	zirconium based hydrogen absorbing alloys
1014	ラーベス相水素吸蔵合金	RÂBESU SÔ SUIISO KYÛZÔ GÔKIN	the hydrogen absorbing alloys having the Laves phase structure among hydrogen absorbing alloys NOTE: They are also called “RÂBESU SÔ GÔKIN” or “RÂBASU SÔ GÔKIN”. MgCu ₂ , MgZn ₂ , MgNi ₂ and the like are included. And for the other alloys, Ti-Mn alloys, Ti-Cr alloys, Zr-Mn alloys and the like are included.	Laves phase hydrogen absorbing alloys
1015	高温型水素化物	KÔON GATA SUIISO KABUTU	a hydride of about 200 °C or higher in standard decomposition temperature NOTE: The hydrides producing magnesium based hydrogen absorbing alloys, the hydrides producing Ti-Ni based alloy (titanium based hydrogen absorbing alloys) and the like are included.	high temperature hydride
1016	中温型水素化物	TYÛON GATA SUIISO KABUTU	a hydride of about 50 °C to 200 °C in standard decomposition temperature NOTE: There are Ca-Ni based alloy, Ti-Co based alloy, Zr-Mn based alloy, etc.	medium temperature hydride
1017	低温型水素化物	TEION GATA SUIISO KABUTU	a hydride under 50 °C in standard decomposition temperature NOTE: There are La-Ni based alloy, Mm-Ni based alloy, Ti-Fe based alloy, Ti-Mn based alloy, etc.	low temperature hydride