Mineral Liberation Study in The Huanuni Mine, Bolivia*

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The Huanuni ore deposit in the central part of the eastern Andes is a representative tin vein type ore deposit in Bolivia. The veins consist of cassiterite as a economic mineral, being associated mainly with pyrite, pyrrhotite, quartz, tourmaline and rutile.

In this study, the species, grain sizes, shapes of the grains, types of intergrowth, compositions of grains, etc., of each mineral were characterized to assess the liberation characteristics of the ore. Observation on polished specimens under the microscope, heavy liquid separation, powder X-ray diffraction and chemical analysis by ICP were the techniques used to accomplish the mineral liberation study.

Samples collected from the feed in the Huanuni's beneficiation plant were ground and classified into 6 size fractions from mesh Nos. 2 to 200. Each fraction was then separated according to their densities into 8 ranks from +3.20 g/cm³ to -2.05 g/cm³.

The density spectrum has been distributed into two fraction groups, one of +3.20 g/cm³ and the other of -2.90 g/cm³, with lack of intermediate density fractions between them.

X-ray diffraction and microscope analysis have revealed that the heavy group was characterized by the presence of predominant sulfides-cassiterite, and the light one by predominant quartz. The results were confirmed by the chemical analysis of tin and iron. Detailed particle counting under the microscope indicated that about 70% of total cassiterite was liberated by grinding the raw ore to sizes of -100 +200 meshes. However, some "liberated" cassiterite particles, even in the finer fraction (-150 +200) still contained inclusions of about 3 μ m to 15 μ m of tourmaline, pyrrhotite, pyrite and rutile.

KEY WORDS: Mineral Liberation, Cassiterite, Huanuni Mine, Bolivia.

1. Introduction

About four-fifths of the world's tin is at present obtained from alluvial deposits and the remainder from lode mining.

In alluvial deposits the ground is worked by hydraulic mining and dredging. In hydraulic mining, the ground is broken by means of a jet of water and the slurry is fed by gravel pump to a concentrator. In dredging, the mud is broken by tumbling with water before it is discharged to the concentrator. On the other hand, in lode mining, the veins are emplaced in rock. They are broken up with explosives and the shattered rock is passed by successive stages of comminution required for beneficiation processes. Since cost of comminution are extensively high, the achievement of optimum liberation is therefore of great importance, and accordingly, great attention should be paid to the subject when ores are investigated from an economic point of view.

The largest field of lode mining is Bolivia where the Huanuni mine, owned by the Corporacion Minera de Bolivia (COMIBOL), is a representative tin deposit. It consists of cassiterite as an economic mineral, being associated with pyrite, pyrrhotite, quartz, tourmaline and rutile. The minerals

generally are fine, formed under super saturation caused by "boiling" of the ore forming fluid¹⁾.

In the present study, parameters as grain sizes, shapes of the grains, types of intergrowths, composition of grains, associations and distributions and amounts of composite minerals were statistically characterized to assess the efficiency on the liberation properties of the ore.

Although ore microscopy was the used technique to investigate the optical properties of composite minerals and to perform the particle counting, the process of heavy separation allowed the evaluation and distribution of particles of cassiterite, which were dispersed before the separation in a great amount of gangue mineral particles, for a subsequent mineral liberation and separation.

Other techniques used in this study were X-ray diffraction and chemical analysis by ICP.

2. Methods

The samples used in this study were collected from the ball mill feed in the Huanuni beneficiation plant. Their average particle size was about 10 mm. The samples were quartered and ground with ball mill for about 45 min by wet method. The mill products were then sieved using mesh Nos. 2, 4, 10, 65, 100, 150 and 200.

The heavy media separation was performed on quartered samples of each sieved fraction using heavy liquids of known densities. The heavy liquids used in this study and their

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Table 1 Liquids used in the heavy media separation.

Heavy Liquid	Density*
Tetrabromoethane (acetylene tetrabromide)	2.85
Diiodomethane (methylene iodide)	3.20
Ethanol	0.77

* Densities measured at 20°C using picnometer.

densities are shown in **Table 1**. The separating mediums of different density were obtained by mixing the heavy liquids with ethanol.

The optical and texture properties of minerals were investigated under the microscope. X-ray diffraction analysis was used as supplement technique to identify the composite minerals of ore and gangue phases. The overall chemical analysis for the relevant elements was determined by optical emission spectroscopy using an inductively coupled plasma source (ICP) after the powdered samples have been dissolved in aqua regia.

The degree of liberation was determined by systematic particle counting on polished sections from separated fraction particles mounted in resine. The numbers of particles counted for individual minerals were first converted to percentages and then to weight percentages using their specific gravities taken from bibliography²⁾. The grades of tin and iron were calculated from chemical compositions of their host minerals cassiterite and pyrite-pyrrhotite, respectively. Since the general chemical formula of pyrrhotite is not stoichiometric (Fe_{1-x}S), the value for x was assumed to be 0 ($x = 0$) in order to estimate the approximate content of iron.

3. Results

Particle Size Distribution of Ground Samples

The particle size distribution of milled products is shown in **Fig. 1**. As seen in the figure, the cumulative 50% corresponds to the representative particle size of 0.6 mm and the maximum particle size is about 10 mm.

Results of Heavy Media Separation

The density spectrum of ground particles is shown in **Fig. 2**. In the figure, the density spectrum is mainly separated

Fig. 1 Particle size distribution of milled products in Log cumulative percent vs. Log particle size (mm). In parentheses are the mesh number.

into two distinct density fraction groups, one is +3.20 and the other -2.90. Those groups are observed more clearly with decreasing of particle size.

It should be mentioned that particles finer than 200 mesh were not separated as far as this study, although they probably show a higher degree of liberation, because of difficulties of circulation accompanied by coagulation of those particles in the liquids used.

Results of X-ray diffraction Analysis

The results of X-ray diffraction analysis for each of the separated fractions are shown in **Table 2**. As seen in the table,

Fig. 2 Distribution of weights of separated fractions as a function of specific gravity.

Table 2 Results of X-ray diffraction analysis of separated fractions.

FRACTION			MINERALS IDENTIFIED							
Mesh No.	Spec.	Grav.	Cs	Py	Po	Qt	To	Rt	Sd	Cl
- 2	-2.90	+2.65	m	m		m	m	vw	vw	vw
+4	-2.65	+2.45		vw		S	m	vw		w
- 4	+3.20		m	S		m	m		w	
+10	-2.90	+2.65	m	m		m	m	vw		vw
	-2.65	+2.45	w			S	m			w
- 10	+3.20		m	S	w	m	m		w	
+65	-2.90	+2.65	m	m	w	S	m	vw	vw	vw
	-2.65	+2.45	w	w		S	m	vw		
	-2.45	+2.20	vw	vw		S	m	vw		
- 65	+3.20		m	m		vw	vw		vw	
+100	-2.65	+2.45	vw	vw		S	m	vw		vw
	-2.45	+2.20				S	w	vw		
-100	+3.20		w	m	m	w	w	vw	vw	
+150	-2.90	+2.65	w			m	m	vw	vw	vw
	-2.65	+2.45		vw		S	w	vw		vw
	-2.45	+2.20		vw		S	w	vw		vw
-150	+3.20		w	m	m	w	m	vw		
+200	-2.90	+2.65	vw	vw		m	m			w
	-2.65	+2.45	vw			S	m		vw	
	-2.45	+2.20				m	m	vw		w

Explanation: Cs = cassiterite, Py = pyrite, Po = pyrrhotite, Qt = quartz, To = tourmaline, Rt = rutile, Sd = siderite, Cl = clay, S = strong, m = moderate, w = weak, vw = very weak.

cassiterite and pyrite-pyrrhotite are common in fractions of densities +3.20, whereas rutile, siderite and clay minerals showed relatively weak peaks and did not indicate any tendency of distribution in the separated fractions. In addition to the minerals listed in Table 2, marcasite, sphalerite, stannite and chalcopryrite were identified with very weak diffraction peaks.

Chemical Analysis

In Fig. 3 are shown the weights of tin and iron in each separated fraction as a function of specific gravity. As seen in the figure, both elements were distributed in almost the same densities showing a tendency of distribution.

The grades of tin and iron in each separated fraction are shown in Table 3. As seen in the table, the finer the particle size is, the greater is the ratio between both elements.

Average grades of tin and iron in separated fractions were calculated by dividing the total weights of each element vs. the total weight of the sample:

Fig. 3 Distribution of weights of tin and iron as a function of specific gravity. Open data: iron; hatched data: tin. Open data are included in hatched data.

$$\text{Sn grade} = \frac{\text{Total weight of Sn (g)}}{\text{Total sample weight (g)}} = \frac{64.62}{4400} = 1.47\%$$

$$\text{Fe grade} = \frac{\text{Total weight of Fe (g)}}{\text{Total sample weight (g)}} = \frac{219.67}{4400} = 4.99\%$$

The grades of tin and iron, obtained from direct chemical analysis of bulk samples are:

$$\text{Sn} = 1.37\%$$

$$\text{Fe} = 3.72\%$$

Although -200 product was not separated by heavy liquids, the chemical analysis for tin and iron in that mesh product indicated grades of 1.72% for tin and 4.30% for iron.

Results of Microscopic Analysis

The detailed mineralogy of the ore in the Huanuni mine has been already reported³⁾. The results of the microscopic analysis on mineralogical characteristics of separated fractions are summarized in Table 4. The ore phase was mainly composed of cassiterite, pyrite, pyrrhotite, marcasite, stannite, sphalerite and chalcopryrite. The most frequent gangue minerals were quartz, tourmaline, rutile, siderite and clay (Table 4). Sulfides and cassiterite were common in fractions of densities +3.20, whereas predominant quartz and clay minerals were frequent in fractions of densities -2.90 (Fig. 4).

Since the desired mineral was cassiterite, the particle counting analysis was carried out in separated fractions of densities +3.20, where cassiterite was mainly concentrated. Because of cassiterite particles coarser than 100 mesh were scarcely liberated (Figs. 4, 5a to 5d) and in order to confirm the reproducibility of the degree of liberation from the first grinding process, samples of -10 +65 mesh fraction were reground, classified to -100 +150 and -150 +200 mesh and then separated to densities +3.20.

Results of weight percentages of liberated minerals obtained from the analysis of -100 +150 and -150 +200 mesh fractions, have indicated that those of cassiterite and pyrite decreased considerably, but those of tourmaline increased in the latter mesh fraction with respect to the former one (Tables

Table 3 Distribution of grades for tin and iron in each separated fraction.

SPEC. GRAV.	+3.20	-3.20	-3.05	-2.90	-2.65	-2.45	-2.20	-2.05
MESH (No.)		+3.05	+2.90	+2.65	+2.45	+2.20	+2.05	
- 2 +4	—	—	—	3.71	1.07	—	—	—
		—	—	18.20	3.06	—	—	—
- 4 +10	16.81	—	—	1.94	0.55	—	—	—
	37.49	—	—	7.30	1.33	—	—	—
- 10 +65	7.49	—	—	3.03	0.34	0.98	—	—
	22.98	—	—	13.76	0.87	0.37	—	—
- 65 +100	16.20	—	—	2.06	0.13	0.12	0.94	—
	44.01	—	—	8.37	0.26	0.96	1.36	—
-100 +150	9.94	—	—	1.53	0.32	0.28	—	—
	31.35	—	—	26.20	1.97	1.77	—	—
-150 +200	5.81	—	—	0.10	0.04	0.001	—	—
	20.84	—	—	1.89	0.17	1.32	—	—

Note: The upper values correspond to tin whereas the lower ones to iron.

Table 4 Mineral characteristics of ore and gangue phases in the feed at the Huanuni mine.

MINERAL	GRAIN SIZE	HABIT	ASSOCIATION	MODE OF OCCURRENCE	TEXTURE
Cassiterite	200 ~ 900 μm	subh. to anh.	to; qz; to+qz; py; po; rt.	mass agg.; interlocked	simple locking, mutually curving boundaries
Pyrite	50 ~ 700 μm	euh. to anh.	qz+to; cs; po; to; st+sp+cp; mc	mass agg.; interlocked single crystal; "colloidal"; disseminated	equig.; mutually curv. boundaries
Pyrrhotite	40 ~ 300 μm	euh. to anh.	qz; to; py; rt; cs; mc; st; sp; cp	mass agg. disseminated	simple locking mutually curving boundaries
Marcasite	~ 100 μm	anhedral	py; po; sd	replac. of py; exsol. with po, single crystal	simple locking, mutually curving boundaries
Stannite	30 ~ 200 μm	subh. to anh.	sp; sp+cp; cp; py	interlocked	simple locking,
Sphalerite	10 ~ 150 μm	subh. to anh.	st; cp; st+cp; py	interlocked	simple locking
Chalcopyrite	50 ~ 150 μm	anhedral	sp; st; sp; st; py; qz	mass agg.; interlocked incl. in st and sp	simple locking
Quartz	300 ~ 800 μm	euh. to anh.	to; cs; py; po; rt	mass agg.; interlocked	simple locking
Tourmaline	15 ~ 450 μm	euh. to anh.	qz+rt; po; cs; py; po	mass agg.; inclusions as acicular crystals	simple locking; radiating; deep penetr.
Rutile	15 ~ 300 μm	subh. to anh.	to; qz; cs; py; po	inclusions; single crystals	simple locking
Siderite	10 ~ 100 μm	subh. to anh.	qz; to; cs; mc; py; po	veinlets; mass agg.	fract. filling; simple locking
Clay	10 ~ 80 μm	subh. to anh.	qz; sd; mc	veinlets; mass agg.	fract. filling; simple locking

Explanation: euh = euhedral, subh = subhedral, anh = anhedral, cs = cassiterite, py = pyrite, po = pyrrhotite, qz = quartz, to = tourmaline, rt = rutile, st = stannite, sp = sphalerite, cp = chalcopyrite, mc = marcasite, sd = siderite, agg = aggregate, replac = replacement, exsol = exsolution, incl = inclusions, equig = equigranular, curv = curving, penetr = penetration, fract = fractures.

5a and 5b). In both fractions the degrees of liberation of pyrite, pyrrhotite and tourmaline were higher than cassiterite. In Tables 5a and 5b are shown also the grades of tin and iron, which were calculated from chemical compositions of their host minerals.

The most frequent interlocking of minerals are shown in Table 5c. As seen in the table, unliberated cassiterite was interlocked mainly with tourmaline in fraction sizes -100 +200 mesh.

The liberation degrees of cassiterite were calculated from percentages of free and interlocked particles, obtained in the particle counting analysis (Tables 5a to 5c). Since the liberation of a mineral in ore products can be defined as the percentage of the mineral that is present as free particles⁴⁾, the liberation degrees of cassiterite in -100 +150 mesh fraction were 71.81% and 73.33% for ground and reground samples respectively. Moreover, cassiterite in -150 +200 mesh fraction showed liberation degrees of 79.35% for ground and 71.43% for reground samples.

4. Discussion

The particle size distribution of milled products is shown in Fig. 1. As seen in the figure, the size distribution of ground product showed different behavior in Gaudin-Schuhman plot for particles size -2 + 100 mesh and for -100 mesh (Fig. 1)⁵⁾, because of mixed composition of hard (rocks) and soft (clay) minerals, respectively.

The heavy liquid separation indicated two density fraction groups for particles size -4 +200 mesh, one was +3.20 and the other -2.90 (Fig. 2). The remainder particle fraction -2 +4

mesh, which is the coarsest in this study, was separated only in the latter density group, because of the presence of predominant lower density minerals in their interlocked particles.

The densities of the main minerals from separated fractions are: cassiterite = 6.99, pyrite = 4.7, pyrrhotite = 4.6, tourmaline = 3.15 and quartz = 2.67²⁾. As seen in Table 1, the highest density in the heavy media separation performed in the present study was limited to 3.20 (density of diiodomethane).

X-ray diffraction and microscopic analysis indicated that minerals of +3.20 density fraction were mainly cassiterite and sulfides, whereas separated fractions within densities -2.90 and +2.20 were composed of predominant lower density minerals as quartz and clay (Table 2). The presence of free particles of lower density minerals into higher density fractions e.g. tourmaline in +3.20 fraction was due probably to the coagulation of particles in the heavy liquid⁶⁾. The lack of fractions within densities -3.20 and +2.90 (Fig. 2) would be explained by the wide differences in densities between those of predominant minerals in both +3.20 and -2.90 fraction groups (Table 2 and Fig. 4). That gap would even be extended as high as the relative density of composite minerals in density +3.20 fraction group, if the density of heavy liquid used would be higher than 3.20. In any case, densities about 3 would be considered as guide condition for the separation of sulfides-cassiterite rich from quartz rich fractions.

The chemical analysis showed that tin and iron are distributed at nearly the same densities in each size fraction. However, both elements are mainly concentrated at densities +3.20 as decreasing the particle size. Therefore, the products separated in density fraction +3.20 will be composed mainly

Fig. 4 Microphotographs of mesh -10 +65 fraction at different densities. Sulfides and cassiterite are common at density +3.20 (a), whereas quartz is predominant at densities lower than 2.90 (b and c).

by the host minerals of tin and iron (Tables 2 and 3).

The microscopic analysis showed that most of the cassiterite was liberated in particles of sizes finer than 100 mesh (Fig.5). However, some "liberated" cassiterite particles even in the finest fraction of this study (-150 +200 mesh), still contained inclusions of minerals as tourmaline, pyrrhotite, pyrite and rutile from about 3 μm to 15 μm in size (Table 4). Since it is not economically practical to carry liberation to completion⁶⁾, the liberation degree of cassiterite obtained in -100 +200 mesh fractions (about 70%) may be considered

Fig. 5 Microphotographs of mesh -100 +150 (a and b) and mesh -150 +200 (c and d) fractions for ground (a and c) and reground (b and d) samples.

Table 5 Results of microscopic particle counting analysis of liberated (a and b), and unliberated minerals (c) in mesh -100 +150 and -150 +200 fractions, both of densities +3.20.

a) Liberated minerals in mesh -100 +150 fraction

MINERAL	GROUND		REGROUND	
	LIBERATED PARTICLES %	WT. % LIB. PARTICLES	LIBERATED PARTICLES %	WT. % LIB. PARTICLES
Cassiterite	9.05	13.79	10.48	15.37
Pyrite	42.43	46.26	53.33	55.95
Pyrrhotite	20.98	21.04	13.33	12.87
Stannite	0.13	0.12	—	—
Chalcopyrite	0.13	0.12	—	—
Quartz	1.07	0.62	0.96	0.53
Tourmaline	25.47	17.49	17.14	11.33
Siderite	0.54	0.47	4.76	3.95
Clay	0.20	0.09	—	—
TOTAL	100.00	100.00	100.00	100.00
No. particles	1492		105	
Sn grades	10.86*; 9.94**		12.11*	
Fe grades	34.90*; 31.35**		33.20*	

b) Liberated minerals in mesh -150 +200 fraction

MINERAL	GROUND		REGROUND	
	LIBERATED PARTICLES %	WT. % LIB. PARTICLES	LIBERATED PARTICLES %	WT. % LIB. PARTICLES
Cassiterite	5.41	8.86	4.20	7.05
Pyrite	26.15	32.37	32.77	39.32
Pyrrhotite	15.90	18.11	17.65	19.49
Sphalerite	0.30	0.30	—	—
Chalcopyrite	0.59	0.61	—	—
Quartz	1.77	1.17	2.52	1.60
Tourmaline	48.30	37.33	36.13	27.31
Siderite	0.99	0.97	3.36	3.19
Rutile	0.59	0.28	0.84	0.85
Clay	—	—	2.52	1.18
TOTAL	100.00	100.00	100.00	100.00
No. particles	4050		119	
Sn grades	6.98*; 5.81**		5.55*	
Fe grades	26.57*; 20.84**		27.38*	

c) Mineral interlocking in unliberated particles.

MINERALS	MESH -100 +150 FRACTION		MESH -150 +200 FRACTION	
	GROUND (%)	REGROUND (%)	GROUND (%)	REGROUND (%)
Py + To	28.09	33.33	25.78	41.67
Po + To	22.47	19.05	20.00	33.33
Cs + To	16.48	19.05	12.44	20.00
Py + To	6.74	4.76	4.44	—
Po + Qz	5.24	—	3.11	—
Cpy + To	2.25	14.29	3.56	—
Cs+Qz+To	3.37	—	—	—
Others	15.36	9.52	30.67	5.00
TOTAL	100.00	100.00	100.00	100.00
No. particles	267	21	457	12

Note: * and **: calculated from stoichiometric compositions and from chemical analysis, respectively.

as optimum and metallurgically effective (Fig. 6). The decrease of weight percentage and grade of cassiterite in the size fraction -150 +200 with respect to -100 +150 mesh fraction (Tables 3, 5a and 5b), would be explained by the dispersion⁶⁾ of cassiterite in a lower density minerals, perhaps by coagulation⁶⁾, in the former fraction with respect to the latter one.

Fig. 6 Liberation degree of cassiterite as a function of particle size.

5. Conclusions

The mill in the Huanuni mine is composed of cassiterite as the economic mineral, being associated mainly with pyrite, pyrrhotite, quartz and tourmaline.

The density spectrum showed two distinct fraction groups, one of +3.20 g/cm³ and the other of -2.90 g/cm³, with lack of intermediate density fractions between them. The heavy group is composed mainly of sulfides-cassiterite, while the light group of quartz and clay. Thus, densities about 3 could be considered as a guide condition for the separation of sulfides-cassiterite rich from quartz rich fractions. Particles lighter than 2.65 could be rejected in the process of beneficiation without any important loss of cassiterite.

Although some cassiterite particles in -100 +200 mesh fractions still contained inclusions of tourmaline, pyrite, pyrrhotite and rutile (3 to 15 μm in size), the liberation degree of cassiterite obtained in those fractions, that is about 70%, may be considered as optimum and metallurgically effective.

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ボリビアHuanuni鉱山鉱石の単体分離に関する研究

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Huanuni鉱山はボリビアの東部アンデス山地に在り、錫石を稼行対象とするが、錫石の他黄鉄鉱、磁硫鉄鉱、石英、電気石、ルチルなどを伴う熱水鉱脈型多金属鉱床である。

本研究の目的は、鉱物の種類、形状、共生組織を系統的に明らかにして、鉱石の単体分離の特性を評価することである。鉱石の単体分離を知るために、顕微鏡観察、重液分離、粉末X線回折、ICPによる化学分析などを行った。

Huanuni鉱山の原鉱を粉碎し、2～200meshに整粒して、試料とした。分級した試料は、比重3.20～2.05間を8等分した重液で分離した。その結果、各粒度とも比重3.20～2.90間の試料が捕集されず、このギャップを境にして比重の大きいグループと小さいグループとに分かれることが分かった。

X線回折および顕微鏡観察によれば比重の大きいグループは主に硫化物-錫石、小さいグループは主に石英よりなる。Fe、Snの化学分析値もこの傾向を支持している。顕微鏡観察の結果、100～200meshの粒度では約70%の錫石が単体分離する。しかし、いわゆる単体分離した細粒側(150～200mesh)の粒子中にも、しばしば数ミクロンの電気石、磁硫鉄鉱、黄鉄鉱、ルチルなど包有物が含まれている。

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ニュース

(b)

EC(欧州共同体)は1992年には市場統合を目指している。その中で、EC内5カ国のベルギー、スペイン、西ドイツ、英国およびフランスの鉱業学会が“EUROMINERALS”を設立した。その詳細は次で述べる。(前号<8号:会告欄PRESS RELEASE>参照)

EUROMINERALS — 「連合学会の結成」

1990年6月6日～9日にストラフブルグにおいて開催されたフランス鉱業学会においてベルギー、スペイン、ドイツ、フランスおよび英国など現在のECメンバー5カ国の鉱業学会によって欧州鉱物連合学会(EUROMINERALS)が設立された。

連合学会の会長には英国IMM会長、DR. BARRY SCOTTが選ばれ、副会長にはフランス会長のCLAUDE BEAUMONTが選ばれた。

基本方針

活動範囲は同5カ国の地域における、鉱物探査、開発および選鉱、製錬ならびに金属処理加工、工業用材料鉱物、固形燃料および採石等全般にわたる。

新会員の入会には現在の連合学会メンバーの4分の3の多数決の投票が必要である。連合学会の拡大にはヨーロッパ地域の非EC国も考慮され、その入会には現会員の全会一致を必要とする。

連合学会は各国学会員によって構成され、個人会員は認めない。各学会は独立性、自主性を尊重し、いかなる場合も連合学会より各学会に負担をかけるようなことはしない。

各学会が連合学会の主旨に反する場合は会員資格を停止する。その会員権停止に関する決議は秘密投票により委員会の3/4必要とする。

連合学会の目的

その目的は情報の推進に便宜をはかり、情報交換、メンバー間

の相互協力ならびに協同行動をはかる。特にその目的は次の事項に関連する。

- EC政府との連絡
- 優秀な科学技術に関する評価
- 技術に関する会合や会議は各メンバー学会において主催し、他の会員の代表者や会員の参加をすすめるとともに特に会合/会議日程および議題については適切に調整を行い実施する。
- 各学会による定期的または臨時刊行物は適切に行い、できる限り論文やペーパーの共同出版をする。

連合学会の組織

連合学会は各国学会より選出された各3名の代表者による審議会(COUNCIL)によって運営され、各学会は一票の投票権とする。審議会はその代表者の中から会長を選出し、その会長は連合学会の会合を招集する。会長の後継者として副会長を選び、事務局を設け、それらの任期はそれぞれ2年とする。

審議会は少なくとも年1回本部または会長と事務局長の協議によって決定された場所で行う。特別の審議会は会員による申入書に従って会長と副会長の同意により実施することができる。

運営資金

連合学会としては当分の間、最少限の経費によりその目的を遂行するため、各国学会においてそれぞれの経費を負担せねばならない。

審議会において決定された特定プロジェクトに関連した所要資金についてはECおよび各国ならびに組織団体の外部より要請する。(W)