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for
Landolt-Börnstein Sub-Series *Ternary Alloy Systems*

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(a) A Brief Introduction

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Since 1984, MSIT[®], Materials Science International Team, is performing the world's largest and most important phase diagram evaluation programs across the national borders of Europe, Asia, North and South America.

Access to the various categories of data, information channels or research projects is administered by the interface software MSIT[®] Connect. Access is subject to a license agreement with MSI, Materials Science International Services, GmbH, Stuttgart.

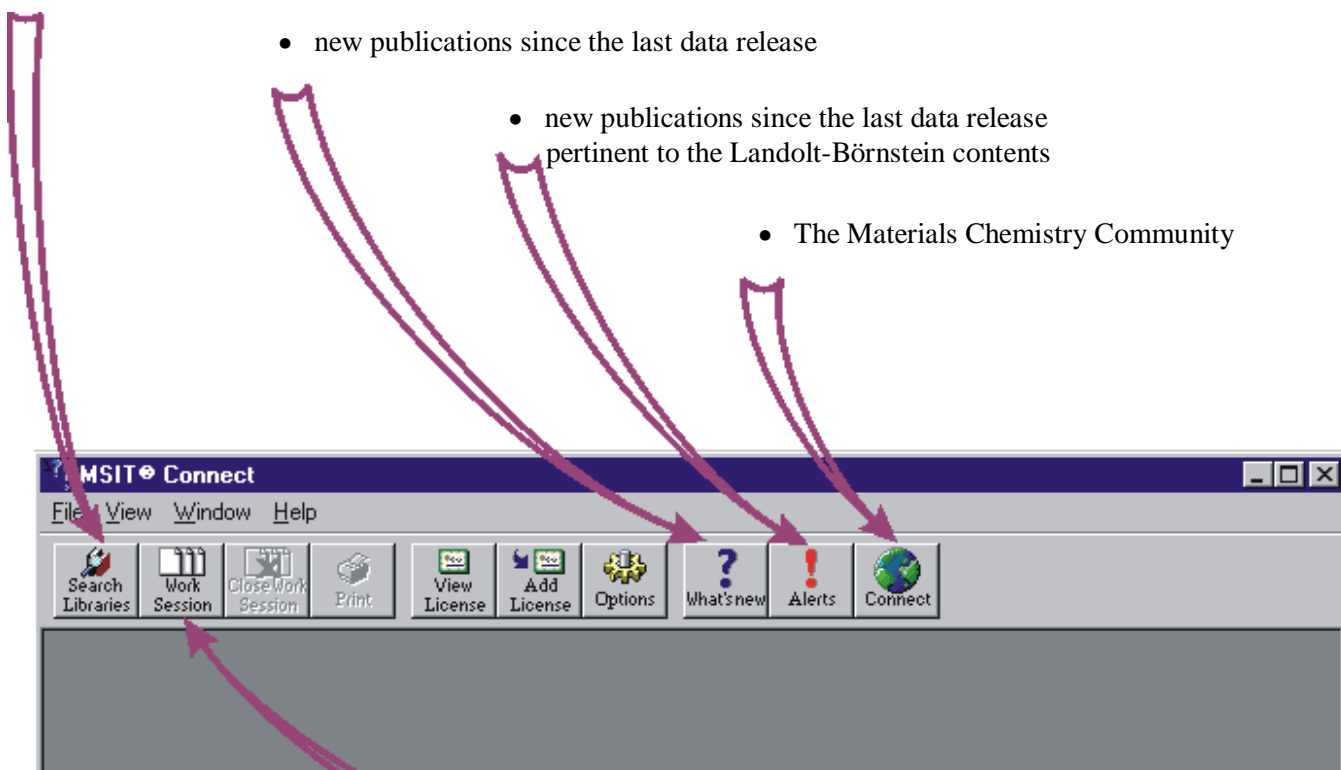
Behind the Buttons

- relevant citations, 1830–recent

- new publications since the last data release

- new publications since the last data release
pertinent to the Landolt-Börnstein contents

- The Materials Chemistry Community



- documents to work with,
interactive Evaluation Reports
(see next paragraph)

(b) What can I do with the MSIT® Workplace?

- ✧ read interactively text, graphics, tables
- ✧ search for phases across tables and diagrams
- ✧ read concentrations just by moving a cursor
- ✧ convert axis scaling from mass% to atom%
- ✧ display micrographs (if included)
- ✧ reference pop-up

Silver - Copper - Tin
Ortrud Kubaschewski

Introduction
[59Geb] investigated the ternary system, mainly in the Ag-Cu region containing up to 25 mass% Sn, by thermal, metallographic and X-ray analyses. For the Sn-rich region, data by [59Wag] (thermal analysis) and by [54Cro] (metallography) were incorporated. 16 four-phase equilibria exist in the ternary system, see the Reaction Scheme, Fig. 1, and Table 2. The phase denominations in Figs. 2-7 were adopted from [77Cha] who reviewed the ternary system.

Binary Systems
The binary systems are taken from [E-S] (Ag-Sn), [80Joh] (Cu-Sn) modified system of that published by [H] and [80Ote] (Ag-Cu). The phase boundaries (37°C) of all three systems are extrapolated.

Solid Phases
No ternary compounds have been found. The intermediate phases of the Ag-Sn and Cu-Sn binary systems are listed in Table 1.

Invariant Equilibria
16 invariant reactions were found to occur in the ternary system; see Fig. 1 and Table 2. The transition equilibria U_1 - U_7 in Fig. 2 correspond to the liquid composition. There are 9 additional four-phase equilibria in the solid state, marked with asterisks in Fig. 1 and Table 2; the compositions of these phases are estimated from line drawings given in [59Geb].

Isothermal Sections
Figures 3 and 4 show the phase equilibria at 500 and 600°C [59Geb]. The homogeneous phases are rather dependent on the temperature and show only a small ternary expansion. The isotherm at 37°C exhibited in Fig. 5 in based on microscopic and X-ray determinations of alloys tempered for at least 6 weeks at 37°C, for experimental details

[77Cha]
Y. A. CHANG, D. GOLDBERG and J.P. NEUMANN,
"Phase Diagrams and Thermodynamic Properties of Ternary Copper-Silver Systems",
J. Phys. Chem. Ref. Data, 6, 621-673, (1977),
(Review, Equi. Diagram, #, 96).

Table 2: Invariant Equilibria

T(°C)	Reaction
605	$L+(Cu) = (Ag)+U_1$
560	$L+\beta = (Ag)+U_2$
550	$L^*(Ag) = \epsilon_2+U_3$
540	$L^*y = \epsilon_2+\epsilon_1$
440	$L+\epsilon_2 = \theta+\epsilon_1$
350	$L^*\epsilon_1 = \theta+\eta$
225	L

Diagram Attributes

Atom%	Mass%
Cu	30.6
Ag	19.8
Sn	39.8
Ag	37.1
Sn	35.7
Ag	49.1

Table 1: Solid Phases

Phase	Symbol	a	Reference
β , $Cu_{17}Sn_3$ (h)	cI2	a = 298.12	13-16 at % Sn [80Joh]
W	W		
γ , Cu_3Sn (h)	cF16	a = 611.66	[V-C]
756-520	BtF ₃		
δ , $Cu_{11}Sn_7$ (h)	cF416	a = 1798	[V-C]

- ✧ view phase diagrams with or without grid
- ✧ enlarge, magnify diagrams
- ✧ export data to clipboard
- ✧ read concentration in zoom
- ✧ overlay diagrams
- ✧ save data in note pad
- ✧ consult help file

✧ connect with MSIT

(c) Ternary Alloy Systems, Update Information

After publication of the individual volumes the authoring team continues to monitor the world literature and to provide update information, related to the previously purchased volumes. By agreement between Springer Verlag and MSI, subscribers of the LB Sub-Series *Ternary Alloy Systems* may request a charge free license for library Public Access Points or for a campus wide access by any desktop.

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Landolt-Börnstein subscribers can retrieve information from the following Data Categories:

<i>Ternary Evaluations</i>	critically evaluated data on the ternary systems
<i>Research Results</i>	summaries of publications on ternary systems
<i>Links to Literature</i>	Permanently updated bibliographic data base (1830–recent).
<i>Diagrams as Published</i>	ternary systems from different sources - <i>not evaluated by MSIT[®]</i>
<i>Current Work Alert</i>	recently published, presently ongoing or planned works.

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always is the most comprehensive one!***

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(a) Insert the CD-ROM and open the file “setup.exe”. This can be done in two ways:

- Click the Windows “Start” button and select “Run...”. In the dialog box type “D:\MSIT Workplace\setup.exe”, replace D: by the correct drive letter for your CD-ROM drive.

- or -

- Open “My Computer” on your Windows desktop and browse the CD-ROM. Open the folder “MSIT Workplace” and double click the file “setup.exe” therein.

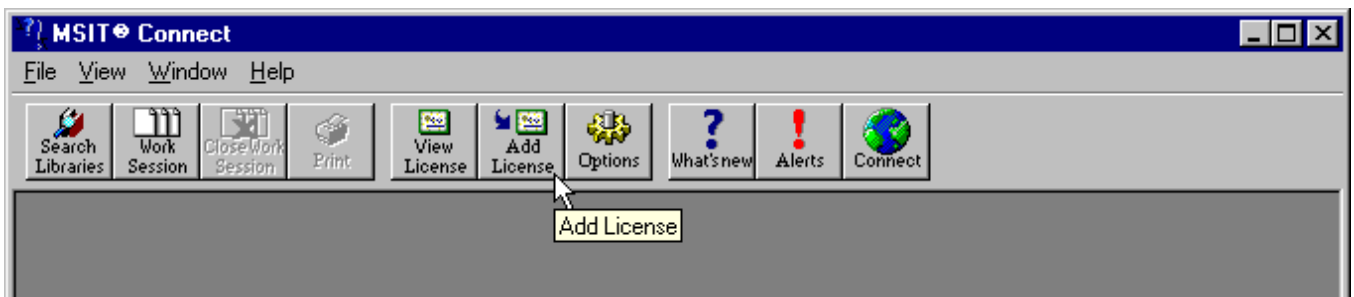
(b) Confirm all dialogs of the installation wizard. Now the software is installed!

2. Get your License Management File, the “xyz.lic” File

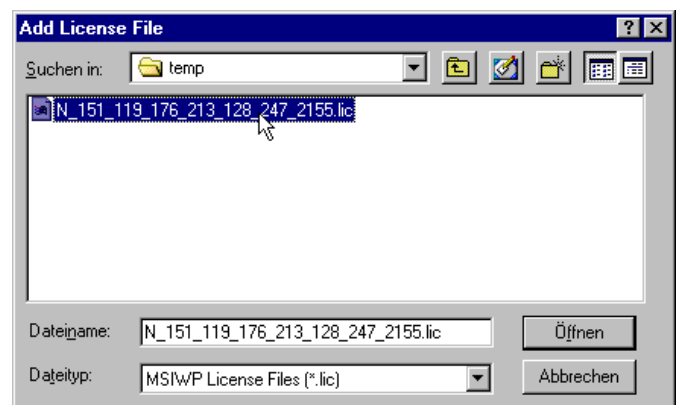
The “xyz.lic” file is available from MSI, upon request and subject to a charge free license contract. Official request by the library or information office has to be made to: license@msiwp.com.

3. Add the “xyz.lic” File to your MSIT Connect Installation

- (a) Start MSIT Connect on your PC and
(b) Click the “Add License” button



- (c) Browse to your “xyz.lic” file and open it, finished!
Now you can work with the MSIT® Workplace.



Note: You have installed the viewing software. The data are on the CD-ROM. When working with the MSIT® Workplace, make sure the CD-ROM is inserted or alternatively copy the data to the hard disk. See <http://www.matport.com/science/workplace/installation/index.shtml>.

(e) Campus License

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See <http://www.matport.com/science/workplace/installation/index.shtml>.

A Campus License will open access for any PC at the site! Contact your system administrator if he can arrange for such a setup.

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