

Analytical Databases Codebook, Ban Chiang Project
Metallography, Elemental, and Microhardness

Metallography

Analysis_number = the unique record identifier. Assigned by the computer.

Serial_number = unique numerical designator for each artifact.

Artifact_ID = excavation abbreviations followed by the small find number/bag number.
For example, BC 0603/0471 = Ban Chiang 1974 excavation; small find number= 603;
bag number = 471

Site = site where material was recovered

BAN CHIANG BC = 1974 excavation at Ban Chiang by Penn/Thai Fine Arts
Department. Excavation abbreviation = BC.

BAN CHIANG BCES = 1975 excavation at Ban Chiang by Penn/Thai Fine Arts
Department. Excavation abbreviation = BCES.

BAN PHAK TOP = 1975 excavation by Penn (William Schauffler). Excavation
abbreviation = BPT.

BAN TONG = 1975 excavation by Penn (William Schauffler). Excavation
abbreviation = BT.

DON KLANG = 1975 excavation by Penn (William Schauffler). Excavation
abbreviation = DK.

Artifact_class = the class to which this artifact is assigned

Adze

Bangle

Bell

Blade

curved

unclassified

Misc (Miscellaneous)

Point

Spear point

Spear point (blade)

Spear point (socket)

Small point

Spike

Wire/Rod

Flat

Amorphous

Prill--crucible

Period = regional period

LP-Protohistoric

MP-LP = Middle to Late Period

MP = Middle Period

EP-MP = Early to Middle Period

EP = Early Period

Subperiod = the division of the Early Period

upper

lower

Alloy = the type of alloy of which the artifact is made.

bronze

bronze leaded = bronze with 2% or more lead

bronze or copper

impure copper = copper with some impurities, but not an alloy

bronze-iron = bimetallic, with bronze hilts and iron blades

high tin bronze = bronze with 20% or more tin

bronze, 9% Sb As leaded = bronze with 9% antimony and over 2% arsenic, and lead.

bronze, 2.9% Sn, 4% As = bronze with 2.5% tin and 4% arsenic

bronze, 3% Sn, 2% As = bronze with 2.9% tin and 2% arsenic

high tin bronze leaded = bronze with over 19% tin and 2% lead.

iron = iron or steel

Where_cut = describes where on the artifact the sample cut was made. There are no fixed codes in this field.

How_mounted = what surface is uppermost in the mount: transverse, longitudinal, or some variation. There are no fixed codes in this field.

Compositional = compositional analysis: whether the artifact was analyzed by

PX = Proton-induced X-ray spectrometry (PIXE)

EDAX = Energy-Dispersive Analysis of X-rays, a proprietary name for EDS
(energy-dispersive spectrometry)

PX, EDAX= Artifact was analyzed by both PIXE and EDAX

n = no compositional analysis

Structure = a brief summary of the metallographic results.

Metallographic_description = a memo field, with an extended description of the metallographic structures in the sample.

Elemental Analyses of Copper-base Objects

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DON KLANG = 1975 excavation by Penn (William Schauffler). Excavation abbreviation = DK.

Analysis_type = the type of compositional analysis performed.

PX = Proton-induced X-ray spectrometry (PIXE)

EDAX = Energy-Dispersive Analysis of X-rays, a proprietary name for EDS (energy-dispersive spectrometry)

PX, EDAX = both type of compositional analysis were performed on the sample.

Artifact_class = the class to which this artifact is assigned

Adze

Bangle

Bell

Blade

 curved

 unclassified

Misc (Miscellaneous)

Point

 Spear point

 Spear point (blade)

 Spear point (socket)

 Small point

 Spike

Wire/Rod

Flat

Amorphous

Prill--crucible

Corrosion = degree of corrosion of the sample, as determined by visual microscopic examination

Little
Mild
Moderate
Severe

Period = regional period

LP-Protohistoric
MP-LP = Middle to Late Period
MP = Middle Period
EP-MP = Early to Middle Period
EP = Early Period

Subperiod = the division of the Early Period

upper
lower

Test_year = the year in which the elemental test was performed. If both PIXE and EDAX were used on the sample, the test year is the year of the PIXE test.

Cu = copper weight percentage (PIXE)

Sn = tin weight percentage (PIXE)

As = arsenic weight percentage (PIXE)

Pb = lead weight percentage (PIXE)

Sb = antimony weight percentage (PIXE)

Fe = iron weight percentage (PIXE)

Ag = silver weight percentage (PIXE)

Ni = nickel weight percentage (PIXE)

S = sulfur weight percentage (PIXE)

Cl = chlorine weight percentage (PIXE)

Sn EDAX = tin weight percentage from EDAX

Pb EDAX = lead weight percentage from EDAX

Fe EDAX = iron weight percentage from EDAX

Hardness Ranges

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Artifact_class = the class to which this artifact is assigned

Adze

Bangle

Bell

Blade

 curved

 unclassified

Misc (Miscellaneous)

Point

 Spear point

 Spear point (blade)

 Spear point (socket)

 Small point

 Spike

Wire/Rod

Flat

Amorphous

Prill--crucible

Material = the metal/alloy from which the artifact was made.

bronze

bronze leaded = bronze with 2% or more lead

bronze or copper

impure copper = copper with some impurities, but not an alloy

bronze-iron = bimetallic, with bronze hilts and iron blades

high tin bronze = bronze with 20% or more tin

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bronze, 2.9% Sn, 4% As = bronze with 2.5% tin and 4% arsenic

bronze, 3% Sn, 2% As = bronze with 2.9% tin and 2% arsenic

high tin bronze leaded = bronze with 20% or more tin and 2% lead.
iron = iron or steel

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Load_gm = the amount of gram weight pressing into the sample.
500
200
100

Area = Area into which the diamond point was impressed. No fixed codes are used in this field.

Hv_range = the range of Vickers microhardness values obtained from 15 seconds pressure at 200 gm from five tests (unless otherwise noted).

Comments = notes on the microstructures and areas of testing.