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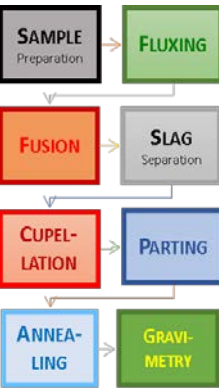
OFFICE FIRE ASSAY SL – CARRER DE NOVELL, 54 – 2nd FLOOR
ES-08014 BARCELONA – SPAIN – EU
WAREHOUSE TSM LOG. – B-682, CTRA. ACCÉS COSTA BRAVA km 1,4
ES-08389 PALAFOLLS – BCN – SPAIN – EU

FIRE ASSAY METHOD : BASIC INFORMATION

Edition
October 2024

FLOWCHART FIRE ASSAY STEPS

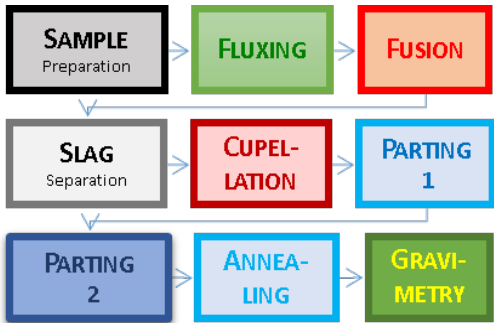


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BIBLIOGRAPHY: IMPORTANT ARTICLES (free download !)	 MUST READ ARTICLES & PAPERS	• 3. ANALYTICAL METHODS FOR DETERMINATION OF GOLD (Articles & Papers): ◊ 3.1 Articles from ► Word Gold Council (WGC) ◊ Assaying Gold Jewellery - Review Methods for Measuring Gold Content Dr. C. W. Corti ◊ Gold Analysis - Comparisons of available Techniques Dr. C. W. Corti ◊ 3.2 Articles from ► "Gold Technology" Magazine (WGC) ◊ "Assaying of Gold Jewel. - Choice of Technique" (GT, nº 32, 2001) Dr. C. W. Corti ◊ "Analysis of Carat Gold" (GT, nº 22, Jul. 1997) M. Brill ◊ "Assaying and Hallmarking in London" (GT, nº 3, Jan 1991) D. W. Evans ◊ "Assaying Gold in Switzerland" (GT, nº 3, Jan 1991) Wälchi / Vuilleumier ◊ "Touchstone Testing of Precious Metals" (GT, nº 3, Jan 1991) Wälchi / Vuilleumier ◊ 3.3 Articles from ► "Gold Bulletin" Journal (WGC) ◊ "Analysis of Gold. A Review of Methods" (GB, Vol. 13, issue 1) Roland S. Young ◊ "Fire Assay Reloaded" (GB, Vol. 47, issue 1) Battaini / Bemporad ◊ 3.4 Articles from ► "Alchemist" Journal , (LBMA) ◊ "The Art & Science of a Precious Metal Lab." (Alch., nº 48, LBMA) David Court ◊ 3.5 Articles from "Pure & Applied Chemistry" Magazine ◊ "Analytical Chemistry of Noble Metals" (Pure & App. Chem., Vol. 49) Jon Cl. van Loon	Articles Corti1 Corti2 Corti3 Brill1 Evans Wälchi1 Wälchi3 Young Battaini Court vLoon	3.1.1 3.1.2 3.2.1 3.2.2 3.2.3 3.2.4 3.2.5 3.3.1 3.3.2 3.4.1 3.5.1
BIBLIOGRAPHY: TEXTBOOKS ► INTERNET ARCHIVE (I.A) (free download !)	 INDISPENSABLE BOOKS	• 4. REFERENCE BOOKS - Free download ► INTERNET ARCHIVE (I.A.) ► Brewster Kahle ◊ 4.1 "A Textbook on Fire Assay" Edward E. Bugbee ◊ 4.2 "Fire Assaying" Orson C. Shepard & Waldemar F. Dietrich ◊ 4.3 "A Manual on Fire Assaying" Charles Herman Fulton ◊ 4.4 "The Sampling and Assay of the Precious Metals" Ernest Alfred Smith ◊ 4.5 "Metallurgy of Gold" Thomas K. Rose ◊ 4.6 "The Precious Metals: comprising Gold, Silver and Platinum" Thomas K. Rose ◊ 4.7 "A Text Book of Assaying" C. Beringer & J. J. Beringer ◊ 4.8 "Introduction to Applied Fire Assay Theory" Don Juergenson & Thomas J. Gilbert ◊ 4.9 "Fundamentals of analysis of gold, silver & platinum group metals" Corby G. Anderson	Bugbee Shepard Fulton Smith Rose1 Rose2 Bering Gilbert Anders.	4.1 4.2 4.3 4.4 4.5 4.6 4.7 4.8 4.9
GOLD ASSAY BEAUTIES: POEMS & WOODCUTS & TEXTS	 ARFE AGRICOLA	• 5. FOUNDATION STONES OF MODERN METALLURGY: (free download) ◊ Touchstone method mentioned in Late Middle Age Poetry ◊ 5.1 "Lo Canviador" - ► Rialc – Università Federico II (Napoli, 1420) Jordi de Sant Jordi ◊ The Founding Fathers - First technological Treatises on Metallurgy & Assaying: ◊ 5.2 "De la Pirotechnia", (Venezia, 1540) Vannoccio Biringuccio ◊ 5.3 "De Re Metallica", (Basel, 1556) Georg Bauer "Agricola" ◊ 5.4 "Quilatador de la Plata, Oro y Piedras", (Valladolid, 1572) Juan de Arfe ◊ 5.5 "Das große Proberbuch", (Frankfurt / Main, 1598) Lazarus Ercker	StJordi Biring. Bauer Arfe Ercker	5.1 5.2 5.3 5.4 5.5



THE TREE
OF
LANGUAGES

1.1 GOLD ASSAY : - CUPELLATION



THE FIRE ASSAY PROCESS
STEPS CHART

ISO 11426: 2021	Determination of gold in gold jewellery alloys Cupellation method (fire assay)	ASTM E 1335-08	Standard Test Methods for Determination of Gold in Bullion by Fire Assay Cupellation Analysis
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English	Deutsch	Nederlans	Français	Italiano	Castellano	Русский
						
	Dach	Taalunie.org	Franophonie.org	Accademiadellacrusca.it		Ruslang.ru
absorption	Absaugung	absorptie	absorption	assorbenza	absorción	поглощение емкость
anneal (to) / (~)ing / (~)ed	ausglühen / <u>abätmen*</u> ausgeglüht	warmen / op(~) / ver(~) / verhitten	recuire / recuit	ricuocere / ricottura / ricotto	recocer / recocido	разваривание королька, отжиг (прокаливание)
assay office	Punzierungsamt / Probieramt	waarborg / Keuringsinstellin	bureau de garantie	ufficio metrico / uffici metrici	contrastaría / contrastarías	пробирная палата
assayer (sworn)	<u>Edelmetallprüfer(in)</u> (beeidigter / beeidigte)	keurmeester probeert (beëdigd)	<u>essayeur / essayeuse</u> (<u>juré / jurée</u>)	<u>saggiatore (giurato) /</u> <u>Sazadori / Toccadori</u>	(a)quilator (jurado)	пробирщик (присяжный)
bead / prill	Regulus / Perle	koninkje / bolletje	régule / roitelet	regolo / palloncino / pallina	régulo / botón	королёк
bone ash	Knochenasche	bot as	cendre d'os	cenere d'ossa	ceniza de hueso	костяная мука
bullion blocks	Block / Blöcke	blok / cupelblokje	bloc / blocs	blocco / blocchi	bloque / bloques	блок / блоки
cornet	Spitztüte / Röllchen	cornet / rolletje	cornet	cornetto	cornete / cartucho	корточка
cupel / cupels	Kupelle / (~)n / Capelle*	cupel	coupelle /coupelles	coppella / coppelle	copela / copelas	капель / капли
cupel (to)	kupellieren / treiben/ ab(~)	cupellieren / afdrijven	coupeller	coppellare	copelar	купелировать
cupellation / micro(~)	Kupellation / Mikro(~), (Ab)-Treiben, Treibarbeit	cupellatie / micro(~)	<u>cupellation</u> / micro(~)	coppellazione / micro(~)	copelación / micro(~)	купелирование / микро(~) / купеляция капельный метод
drive, driving	<u>treiben</u> , getrieben	sturen			tracción	
duplicates	Duplikat	duplicitaat	dosage en double	uplicati	duplicados	дубликат
feathers (litharge)	Feder (Bleioxid)	veer (litharge)	plumes (litharge)	penne (litargirio)	plumas (litargirio)	перья (окись свинца)
fineness	Feingehalt	fijngehalte	finesse	finezza	fineza	тонкость
freezing	Einfrieren, Erstarrung	invriezen	<u>congélation</u> , solidification	congelamento, solidificazione	<u>congelación</u> , solidificación	конгеляция, затвердевание
furnace	Ofen / Treibherd*	oven	Four	Forno	Horno	печь
gravimetric	gravimetrisch	gravimetrisch	gravimétrique	gravimetrica	gravimétrica	гравиметрическое
hallmark (-ing)	<u>Punzierung</u>	<u>waarmark</u> / keur rijksstempel	<u>poinçonnage</u> poinçon de l'État	punzonatura / <u>bollatura, bollo</u>	<u>punzonado</u> contraste	пуансон / пробирное клеймо
inquart (to) / (in-)quartation	inquartieren / (In-)Quartation	vierendelen	inquart / (in-)quartation	inquarto / inquartazione	incuarto / incuartación	обогащение серебром / (квартирование)
jewellery / jewelry	Schmuck	sieraden / juwelen	bijouterie / joaillerie	oreficeria	joyería	ювелирные изделия
karat	Karat	karaat	carat	carato	quilate	карат
magnesia MgO magnesium oxide	Magnesia -/ Magnesiumoxid	magnesiumoxide	magnésie / oxyde de magnésium	ossido di magnesio	magnesia / óxido de magnesio	окись магния
magnesite MgCO ₃ magn. carbonate	Magnesit	magnesiet	magnésite	magnesita	magnesita	магнетит - карбонат магния
opening	Öffnung	openen	amorce	apertura	destape	открытие
parting	Trennung	Scheiden, trennen	séparation	separazione, spartimento	separación	отделение
play of colours	Farbenspiel / Schillern	kleurenspeel	éclat multicolore / irisation	iridescenza	iridiscencia	Иризация
proof / check (assay) / standard	Proofen	proef	témoin / étalon	testimonio	testigo / referencia	эталон
refinery / refining	Scheideanstalt / Affinerie	raffinaderij	raffinerie	affinazione / raffinazione	refinería / refinación	аффинаж
sample / sampling	Muster / Probegut Probenahme	proeve / monster steekproefneming	échantillon / échantillonnage	campione / campionatura	muestra / muestreo	проба / пробоотбор
spitting	Herausspritzen, Spratzen	spatten	éclabousser	spruzzare	salpicar	отхаркивание
sprouting / vegetation	sprießen, Sproß / Blumenkohl	spruitje / scheut	arborescence	arborescenza	arborescencia / brote	Прорастивание
surcharge	Zuschlag / Überlastung	overgewicht	surcharge	sovraccarico	sobrecarga	перегрузка
title	Titel	titel	titre / teneur	titolo / tenore / <u>peggio</u>	título / tenor	титр

* Original German term (or spelling) from **Agricola's** Glossary of *De Re Metallica* (or his *Interpretation*)

Fire Assay is *the Standard Reference Technique* against which the other methods are compared

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1. MULTILINGUAL VOCABULARY

October 2024
Voc_2_Fire_Assay.doc



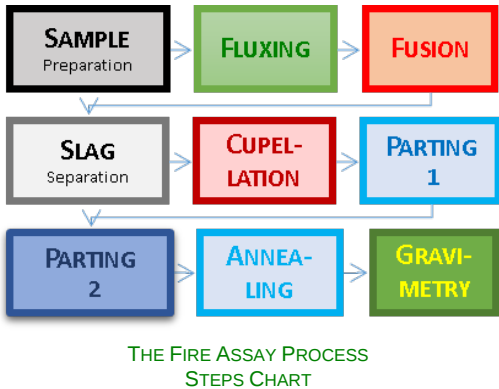
THE TREE
OF
LANGUAGES

1.2 GOLD
DETERMINATION :
FIRE ASSAY

- MINERALS

- CONCENTRATES

- RECYCLING



ISO 10378 : 2016	Fire assay gravimetric method & flame AAS Determination of Gold & Silver in Copper, Lead & Zinc sulfide concentrates	ASTM E 1805 - 21	Fire Assay - Gravimetry Standard Test Method Standard Test Method for Fire Assay Determination of Gold in Copper Concentrates by Gravimetry
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English	Deutsch	Nederlans	Français	Italiano	Castellano	Русский
						
	Dach	Taalunie.org	Francophonie.org	Accademiadellacrusca.it		Ruslang.ru
Annealing cup / thimble	Goldglühtiegel / Fingerhut	goud uitgloeien kroes	creuset à or / dé à recuire	crogiolino / ditale da ricottura	crisol / dedal de recocer	отжиг тигель / наперсток
assay flux	Flussmittel	vloeimiddel	fondant	fondente	fundente	флюс / шихта
assay ton	Assay ton	assay ton	assay ton	assay ton	assay ton	пробирная тонна
assay (to)	prüfen, probieren	toetsen	essayer	saggiare	ensayar, quilatar	пробовать
assaying / fire assay	Probe / Feuerprobe	proef / vuurproef	essai / essais au feu	saggio / saggi al fuoco	ensayo / ensayos al fuego	пробирный анализ
assayer	Probierer, Münzwardein	keurmeester	essayeur	saggiatore	(a)quilador	пробирщик
ashes	Aschen	as	cendres	ceneri	cenizas	зола - золы
bead	Perle	kraal	perle	perlina	perla	бусина
blank test	leere Probe	leeg proef	essai en blanc	prova in bianco	prueba en blanco	холостая проба
button (lead)	Bleiknopf	lood knoop	bouton de plomb	bottone di piombo	botón de plomo	свинцовый слиток (веркблей)
blink / blink scintillation	Silberblick	flonkering	étincellement (de l'argent)	scintillio (dell'argento)	centelleo (de la plata)	мерцание - сцинтилляция
charge	Ladung	lading	charge	carica	carga	шихтование / шихта / загрузка
collection (lead) / collector / collect (to)	Kollekte / Kollektor / versammeln	collectie / collector	ramassage - collecte / collecteur / collecter	raccolta / collettore / raccogliere	colecta / colector / colectar	коллектирование коллекторов (собирателей) свинцовая плавка
concentrates (ore) crucible (assay)	(Erz)-konzentrate Probirtiegel / (~)n	erts geconcentreerd smeltkroes	concentrés creuset - creusets	concentrati crogiolo / crogioli	concentrados crisol de ensayo	концентраты тигель / тигли
docimasy	Dokimasie	docimasie	docimasie	docimasia	docimasia	количественный анализ содержания металла в руде
fire assay	Feuerprobe	vuurproef	essais au feu	saggio al fuoco	prueba de fuego	пробирный анализ
inquart (ed) (in-)quartation	inquartieren / (In-)Quartation	vierendelen	inquart / (in-)quartation	inquarto / inquartazione	incuarte / incuartación	обогащение серебром / квартование
lemel, sweepings matte, regulus ore	Feilspäne, Schnitzel Matte, Stein, Lech Erz	avfal, vijlsel matte erts	limailles, balayures matte minerais	spazzature matte minerale	escobillas mata mineral	опилки, стружка штейн руда - порода
mould (conical)	(konische) Gußform	kegelachtige vorm	moule conique		molde cónico	
Power oxidising (OP) / reducing (RP) prill (doré)	oxidierende / reduzierende Fähigkeit Perle (goldene)	capaciteit van / oxidatie reductie	potentiel d'oxydation / réduction	potenziale ossidante / riduttore	potencial oxidante / reductor	окислительная / восстановительная способность
reductive fusion	reduzierende Schmelzung	reducerende fusie	fusion plombeuse	fusione riduttrice	fusión reductora	восстановительная плавка / тигельная плавка
roasting	Rösten	roosteren	torréfaction	per arrosto	tostación	кальцинация - обжиг
scorifier / scorification	Ansiedescherbe	schef	scorificatoire / scorification	scorificatore / scorificazione	escorificador / escorificación	шербер / шерберная плавка
scrap	Schrott	schroot	ferraille	rotami	chatarra	скрап
lead shot	Bleischrott	lood schot	grenaille de plomb	pallini di piombo	granalla de plomo	свинцовая дробь
slime (electrolytic)	Schlamm	slijm	boue électrolytique	fango elettrolitico	lodo electrolítico	шлам
slag	Schlacke	Slak	scorie	scorie	escoria	шлак
speiss	Speise	speiss	speiss	speiss	speiss	шпейз
to smelt,; smelting	schmelzen, verhütten / Verhüttung	smelten	fusion d'un minerai ou d'un métal	fusione	fusión de un mineral o de un metal	плавка, / выплавлять, расплавлять металл

MULTILINGUAL TERMS: ►1. Cupellation ►2. Fire Assay ►3. Reagents - Fluxes - Collectors ►4. Other Assay Methods ►5. Metals ►6. Gold Minerals
CONTEXT: ►Assay Ton ►Blank ►Steps ►Feathers ►Matte/Speiss ►Colours ►Spitting ►Sprout ►Surcharge ►Inquart ►Hallmark ►Cupels ►Scorifiers

Fire Assay is the Standard Reference Technique against which the other methods are compared

