

**ASSAYING: IN
THREE PARTS.
PARTS II AND III**

Published @ 2017 Trieste Publishing Pty Ltd

ISBN 9780649032570

Assaying: In Three Parts. Parts II and III by C. H. Aaron

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C. H. AARON

**ASSAYING: IN
THREE PARTS.
PARTS II AND III**

ASSAYING

IN

THREE PARTS

PART 1ST.—GOLD AND SILVER ORES; PART 2D.—GOLD AND SILVER BULLION; PART 3D.—LEAD, COPPER, TIN, MERCURY, ZINC, NICKEL AND COBALT, CHROMIUM, BISMUTH, ARSENIC, ANTIMONY, SULPHUR, SALT.

By C. H. AARON, METALLURGIST,

AUTHOR OF

"TESTING AND WORKING SILVER ORES," "LEACHING GOLD AND SILVER ORES."

PARTS II, AND III,

FOURTH EDITION.

PUBLISHED AND SOLD BY
THE MINING AND SCIENTIFIC PRESS,

OF SAN FRANCISCO

1906.

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TO
The Mining and Scientific Press,
OF
SAN FRANCISCO, CAL.

THE STEADFAST FRIEND OF TRUTH AND
PROGRESS—AN HONEST PAPER—

THIS BOOK IS RESPECTFULLY DEDICATED
BY THE AUTHOR.

Year	Country	Sector	Emissions (kt CO ₂ e)		Emissions (kt CO ₂ e)	Emissions (kt CO ₂ e)	Emissions (kt CO ₂ e)	Emissions (kt CO ₂ e)	Emissions (kt CO ₂ e)
			1990	2000					
1990	China	Manufacturing and construction	1200	1300	1200	1300	1200	1300	1200
1990	China	Electricity and heat	1500	1600	1500	1600	1500	1600	1500
1990	China	Total	2700	2900	2700	2900	2700	2900	2700
2000	China	Manufacturing and construction	1300	1400	1300	1400	1300	1400	1300
2000	China	Electricity and heat	1600	1700	1600	1700	1600	1700	1600
2000	China	Total	2900	3100	2900	3100	2900	3100	2900
1990	India	Manufacturing and construction	500	550	500	550	500	550	500
1990	India	Electricity and heat	400	450	400	450	400	450	400
1990	India	Total	900	1000	900	1000	900	1000	900
2000	India	Manufacturing and construction	550	600	550	600	550	600	550
2000	India	Electricity and heat	450	500	450	500	450	500	450
2000	India	Total	1000	1100	1000	1100	1000	1100	1000
1990	USA	Manufacturing and construction	2000	2100	2000	2100	2000	2100	2000
1990	USA	Electricity and heat	1500	1600	1500	1600	1500	1600	1500
1990	USA	Total	3500	3700	3500	3700	3500	3700	3500
2000	USA	Manufacturing and construction	2100	2200	2100	2200	2100	2200	2100
2000	USA	Electricity and heat	1600	1700	1600	1700	1600	1700	1600
2000	USA	Total	3700	3900	3700	3900	3700	3900	3700

CONTENTS

PART TWO.

	<i>Page.</i>
Gold and Silver Bullion.....	7
Apparatus	9
Melting Bullion	21
Assaying Bullion	30
Gold Bar	30
Doré Bar	35
Base Bar	37
Gold and Platinum.....	40
Silver Bar	42
Silver Lead	45
Value of Bars.....	46
Humid Assays of Silver.....	48
Gay Lussac's Method.....	48
Measuring the Normal Solution.....	49
Measuring the Decime Solution.....	50
Preparing the Normal Solution.....	51
Preparing the Decime Salt Solution.....	53
Preparing the Decime Silver Solution.....	54
Standardizing the Normal Solution.....	54
The Assay	59
Correcting the Assay.....	63
General Remarks on the Humid Assay.....	64
Recovery of Silver.....	67
Preparation of Pure Silver.....	67
Recovery of Acid.....	69
Volhard's Method	71
Conclusion of Part Two.....	79

PART THREE.

Introduction	83
Manipulation, etc.	84
Lead Ores	95
Fire Assay	95
Wet Assays	97

	<i>Page.</i>
Copper Ores	102
Dry Assay	102
Wet Assays	105
Common Method	105
Aaron's Method	110
Amalgamation	112
Volumetric Methods	113
Cyanide Process	114
Aaron's Method	116
Preparation of Potassium Xanthate.....	120
Tin Ores	122
Mercury Ores	124
Zinc Ores	127
General Method	127
Aaron's Method	130
Aaron's Assay of Nickel and Cobalt.....	134
Chromium	140
Bismuth	142
Arsenic	144
Antimony	146
Sulphur	148
Salt	151
Note	153

PART II.

GOLD AND SILVER BULLION.

IN the assay of bullion, as in that of ore, the first step is to obtain a correct sample, and for this reason it is desirable that the bars of ingots should be made in the establishment in which they are assayed; it is not often that an assayer will place his stamp on a bar without knowing to a certainty that the bar is what it purports to be. Moreover, the best sample is one that is taken from the molten metal, though this is not practised in the case of gold bullion, and it often happens that a lot of silver lead in bars, which in this country is called "base bullion," must be sampled without melting for the purpose. Silver bullion is sampled when melted, before casting. Silver lead is so sampled when practicable. Gold bullion, or base bullion in bars, is sampled by chipping or boring.*

Gold bullion is assayed by inquartation, involving cupellation, and parting; silver bullion by cupellation or by the *humid method*; silver lead by cupellation, sometimes preceded by scorification.

Bars of bullion are called gold, doré, silver, or base.

*Silver bars are also chipped or bored when the metal has been ladled into the moulds from a refining hearth. Pigs of lead containing precious metal are best sampled by drilling, or by means of a hollow punch, which is driven half through from top and bottom. The samples from a number of pigs are melted together at low heat under borax, and cast into a small bar. This bar is then cut in two, and slices are taken from top to bottom for the assays, of which several are made for an average.

The first consist almost entirely of gold, with a little silver and sometimes a very little base metal. They are stamped with the gold fineness and value only, the silver being allowed for in the market price. The second contain a large proportion of gold, a considerable proportion of silver, and sometimes a little base metal. Silver bars are such as consist mainly of silver with little or no gold, nor an excess of base metal. Base bars contain a large proportion of base metal, usually lead or copper. Doré, silver and base bars are stamped with the fineness and value of the gold and of the silver. Gold bars containing more than an insignificant percentage of base metal, although not enough to degrade them to the rank of base bars, are marked B, or Base, in addition to the gold fineness and value. Such are the rules of commercial assaying on the Pacific Coast.

In order to extend the business of ore assaying to bullion assaying also, certain additional apparatus must be provided, as follows:—