GENERAL SUBJECT

ANALYTICAL PROCEDURES

ANALYTICAL PROCEDURES USED THROUGHOUT I.G. FARBENINDUSTRIE PLANTS. INCLUDES MICRO SPECTRAL, POTENTIOMETRIC METHODS ORGANIC AND INORGANIC ANALYSES, MEASURING APPARATUS, ETC.

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Folder Nos.: Anako 1922-36 and Anako 1937 - 1944

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Potentiometric methods
Determination of small quantities of chlorate
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Determination of mono-, di- and triethylamine
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4.) Zusammenkuenfte der Anako.
Meetings of the Anako.

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5) Diazosalicylic acid
6) m-xylidinesulfonic acid
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8) Gallic acid
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10) Benzyl aniline
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3) Calcium carbide
4) Permanganate
5) Phosphorite
6) Sulfuryl chloride
7) Thionyl chloride
8) Sulphur
9) Zinc oxide, zinc chloride, zinc liquors
10) Standardization of normal solutions
11) Sulphur chloride

II. Aliphatic series:

1) Butadiene
2) Sodium methylsulphate
3) Sodium ethylsulphate
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6) Acetaldehyde
7) Oxalylchloride
8) Acetamide

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3) 3- " " "
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5) 3-dimethyltoluidine
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11) 4-chloro - 2 - " "
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III. Newer qualitative tests.
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I Besprechung des Rundschreibens Leverkusens vom 18. Jan. 23.
Discussion of circular letter, Leverkusen of 18-1-23.

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II. Unerledigtes aus der Besprechung vom Nov. 1922
Unsettled subjects from discussion of Nov. 1922.

1 Bericht ueber die Frage ob p-Toluidin gegenueber Anilin resp. Xylidin und m-Nitranilin gegenueber p-Nitranilin so erhebliche Vorzuege besitze, dass die alleinige Anwendung dieser beiden Basen Vorzuziehen ist.

Report re question whether p-toluidine compared with aniline and Xylidine and m-nitraniline compared with p-nitraniline has such advantages as to recommend the use of these 2 bases for analysis.

2. Bericht ueber die Nachpruefung der Trennung der 2-6- und 2-8-Verbindungen nach der Jod- bezw. Kupplungsmethode.
Report re checking the separation of 2-6- and 2-8-compounds by iodine- as well as by coupling method.

3. Bericht ueber die Nachpruefung der Methoden zur Trennung von Schaeffer-und R-Salz an dem von Hoechst eingesandten Muster - vorherige Einsendung der Zahlen durch saemtliche Firmen.
Report re checking of methods for separation of Schaeffer- and R-salt on the sample from Hoechst.

4. Bestimmung von 1-8-Amidonaphtol-4-solfosaeure neben Dioxynaphtalin-4-sulfosaeure mit diazotiertem p-Toluidin.
Determination of 1-8-aminonaphthol-4-sulfonic acid compared with dihydroxy naphtalene-4-sulfonic acid with diazotized p-toluidine.

5 Bestimmung von p-Phenylendiamin, beruhend auf Reduktion von Chlorsilber.
Determination of p-phenylene diamine upon reduction of silver chloride.

6 Bestimmung von m-Phenylendiaminsulfosaeure, congosauer oder essigsauer.
Determination of m-phenylene diamine sulfonic acid, congo acid or acetic acid.

7. Bericht ueber die Untersuchung zur Beurteilung der Qualitaet von gemahlenem Eisen und Zinkstaub.
Report re/examination to judge quality of iron powder and zinc dust.

8. Bestimmung des Gesamtzinks und Cadmiums im Zinkstaub.
determination of total zinc and cadmium in zinc dust.

9. Bestimmung von Amdic-J-Saeure nach Berliner Kupplungsmethode.
Determination of amino-J-acid by coupling method. Berlin.

III. 1 Methoden zur Untersuchung von Kohlenwasserstoff Nitro- und Amidoverbindungen.
Methods for examination of hydrocarbon, nitro- and amino compounds.

a) Destillationsprobe, Theoretisches, Ausfuehrung, Apparatur, Thermometer.
Distillation test, theory, manufacture, machinery, thermometer.

b) Erstarrungspunktbestimmung, Theoretisches, Ausfuehrung, Apparatur, Thermometer.
Determination of freezing point, theory, manufacture, machinery, thermometer.

c) Sonstige physikalische Konstanten.
Other physical constants

d) Reduktion mit Zinnchloruer, Titanchloruer oder Bestimmung mit Nitrit.
Reduction with stannous chloride, titanium chloride or determination of nitrite

2. Besondere Methoden zur Untersuchung von
Special methods for examination of

a) Benzene, toluene, xylol and naphthalene.

b) Nitrobenzene, nitrotoluene, nitronaphthalene assay of di- and trinitro compounds.

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IV. Analysenmethoden fuer Nitrierungen von Sulfosaeuren.
Analytical methods for nitrations of sulfonic acids.

a) 1-nitronaphtalene-5- and 8-sulfonic acid.

b) 1-nitronaphtalene-6,7-sulfonic acid.

c) 1-nitronaphtalene-3-6-8-trisulfonic acid.

V. Zwischenprodukte fuer bunte Schwefelfarben.
Intermediary products for sulfur colors.

1) Dinitrohydroxy phenylamine.

2) p-amino phenol.

VI. Verschiedenes.
Various methods.

Benzidin oder Sulfanilsaeure zum Einstellen von Nitritloesungen.
Benzidine or sulfanilic acid for standardizing of nitrite solutions.

Ergebnis der 3. Analytiker-Conferenz am 13. Maerz 1924. 408-410
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Programm fuer die Analytiker-Besprechung am 9/10. Nov. 1922 in Leverkusen.
Program for analytic discussion 11-9/10-22 Leverkusen. 411-432

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General.

1) Wahl der zu diazotierenden Amine fuer Kuppelungsanalysen mit Bezug auf bequeme Herstellbarkeit der Loesungen und der Diazoverbindungen; Kuppelungsenergie.
Selecting of diazotizing amines for coupling analysis

2) Jodbestimmungen. Allgemeine Anwendbarkeit der Jodmethode. Angabe der verschiedenen Gruppen, die fuer diese Methode in Frage kommen.
Determination of iodine. General application of iodine method, information re various groups suitable for this method.

B) Spezielle Methoden.
Special methods.

1) R-Salzsulfierung.
R-salt sulphonation.

a) Bestimmung des Gesamtgehaltes durch Kupplung, Diazoverbindung, Konzentration, Sodamenge, Salzzusatz.
Determination of total content by coupling, diazo compound, concentration, amount of soda, addition of salt.

b) Trennung der 2.6- und 2.8-Verbindungen.
1) durch Kupplung
2) durch Jodbestimmung
Separation of 2.6- and 2.8- compounds.
1) by coupling
2) by determination of iodine.

c) Trennung vom 2.6 mono und 2.3.6 disulfosaeure.
1) durch Extraktion der Natriumsalze mit Alkohol
2) durch colorimetr. Pruefung mit Nitrit.
Separation of 2.6-mono- and 2.3.6-disulfonic acid -
1) by extraction of sodium salt with alcohol
2) by colorimetric testing with nitrite.

2) 1.8-dihydroxy naphthalene-4-sulfonic acid

a) Determination of 1,8-dihydroxy compounds.
b) Separation of 1-naphthole-4,8-disulfonic acid.
1) by various diazo compounds,
2) by variation of alkalinity.
c) Separation of 1,8-dihydroxy naphthalene.
d) Determination of sulfonic acid.

3) m-phenylene diamine:
a) Determination of substance capable of coupling.
b) Determination of o-compounds.
c) Determination of p-compounds.
d) Qualitative testing methods.

4) m-toluylene diamine:
   a) Determination of substance capable of coupling.
   b) Determination of isomers.
   c) Qualitative testing method.

5) m-phenylene diamine sulfonic acid:
   a) determination by coupling.
   b) determination by isomers.

6) m-toluylene diamine sulfonic acid:
   a) determination of nitrite
   b) determination by acidimetric method
   c) " of iodine
   d) " " sulfonic acid
   e) qualitative testing.

7) B-naphthylamine sulfonic acid 2.5 / 2.8
   a) Determination of total content and
   b) of isomers.

8) 1-amino-8-naphthol-4-sulfonic acid:
   Determination of content and purity.

9) Research methods for
   a) rock salt and
   b) for iron powder.

10) Changing of methods for:
   a) sulfur, sodium, raw smelting and
   b) for zinc dust

3) Analysenmethoden fuer die Untersuchung der Sulfierung von Kohlenwasserstoff. (Analytic Methods for examination of sulfonation of Hydrocarbon.)

1 Allgemeine Methoden zur Bestimmung der Zahl der eingetretenen Sulfogruppen. (General methods for determination of number of added sulfo groups.)

2) Analyse des Benzolmonosulfosauren Natriums. (Analysis of benzene monosulfonic acid sodium.)

3) Trennung und Bestimmung der isomeren Benzoldisulfosaeuren. (Separation and determination of isomeric benzol disulfonic acids.)

4) Trennung der Isomeren in der Naphtalinreihe.
(Separation of isomers in the naphthalene series.)

a. α- and β-monosulfonic acid:
Cleavage of sulfonic group.
Determination of β-acid as Co- or Ni- salt.
Determination of β-acid as tolidine salt.

b) Disulfonic acid:
Determination of 1,5 acid (indirect) by determination of sulfur by precipitation as tolidine salt.
Separation of 1,5 and 1,6-acid.
Determination and separation of 2,6- and 2,7-acid.
Determination of 2,6-acid with p-phenylene diamine.
Determination of 2,7-acid with β-naphthylamine.

5) Anwendung der Bestimmungsmethoden auf normale Sulfierungen, Zusammensetzungen der letzteren.
(Application of methods of determination for normal sulfonations, synthesis of latter.

D) Verschiedenes (various methods)

Programm fuer eine Besprechung de Analysenmethoden der Vorprodukte fuer Triphenylmethanfarbstoffe und der Untersuchungsmethoden fuer Salicylsaeure und Ortho-Kresotinsaeure, Leverkusen, 23-3-1922.
(Program for a discussion of analytical methods of preliminary products for triphenylmethane dye stuffs and research methods for salicylic acid and ortho-cresotinacid, Leverkusen, 23-3-1922). 433-441

I. Benzaldehyde-O-sulfonic acid:
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Phenylhydrazine method.
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II. Ethylbenzylaniline sulfonic acid:
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III. Tetramethyldiamidodiphenylmethane:
Picrate method, freezing point.
Qualitative testing.

IV. Hydrol:
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Separation of purified hydrol.
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m-nitrobenzaldehyde and m-hydroxybenzaldehyde:
Hydrazone method and qualitative testing
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VI Research methods of:
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Manganese dioxide.
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Monoethylaniline, monomethylaniline.
Ethylbenzylaniline, methylbenzyl.
Monoethyl-o-toluidine.
Aniline, dibenzylaniline.
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Monomethyl-o-toluidine

VII Untersuchungsmethoden fuer Salicylsaeure und Ortho-Kresotinsaeure.
Research methods for Salicylic acid and ortho-cresotic acid

Niederschrift der Besprechung ueber Analysenmethoden fuer Alizarinzwischenprodukte am 27. Nov. 1925 in Leverkusen.

Minutes on discussion of analytic methods for alizarin intermediary products. 11-27-25 Leverkusen). 442-450

1. Sulfonic acids.
2. Hydroxyanthraquinones.
3. Aminoanthraquinones.
4. Nitro- and chloroanthraquinones.
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Minutes on a meeting of the analytical Commission, June 1928. 494–497

1. IG analyses.
2. Program for the 12th discussion of analysts.
3. Measuring apparatus.
4. Chemico-technical research methods and hand book by Lunge-Berl.
5. Coupling temperature of Schaeffer salt.
6. Thickness of dye stuff (Staerke der Farbstoffe).

Private communication to Prof. Berl. 498–536

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Electrode carbon.
Determination of bicarbonate content of potassium carbonate.
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Proof of chloride solution as oxygen absorbent agent.
Preparation of standard solution for quantitative determination of chlorine with O-toluidine.
Determination of small quantities of sodium in potassium salt according to Blanchetiere's method, as sodium magnesium uranium acetate.
Determination of Fe in Fe_2O_3 (magnetite).
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Aluminum fluoride.
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Niederschrift der Verhandlungen der Kommission zur Vereinbarung von Analysenmethoden 25. Jan. 1929, Frankfurt.

Minutes of the discussions on analytical methods, 1-25-29 Frankfurt. 537–540

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e) Chem. reine Reagenzien fuer analytische Zwecke.
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Nitroso-β-naphtholbisulphite.

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Proof, separation and gravimetrical determination of (inorganic) anions.

B. Nachweis, Trennung und gewichtsanalytische Bestimmung der Kationen.
Detection, separation and gravimetric determination of cations

IV. Gasanalytische Verfahren (anorganisch und organisch)
Gas analytical processes (inorganic and organic).

V. Massanalyse und Bestimmung der Fh (anorganisch und organisch)
Volumetric analyses and determination of Fh (inorganic and organic)

VI. Nachweis und Reaktionen; Trennungen und gewichtsanalytische Bestimmung organischer Verbindungen.
Proof, reactions, separations and gravimetric determination of organic compounds.

VII. Mikrochemische Analyse.
Micro chemical analysis.

VIII Pharmazeutische und medizinisch-chemische Analyse.
Pharmaceutical and medico-chemical analysis

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4. Absorptionsspektralanalyse fuer Materialien der Praxis, besondere organischer Substanzen (Dr. Rein)
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5. Anwendung von Roentgendiagrammen in der analytischen Praxis (Dr. Seidel)
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6. Spektralanalytische Untersuchung von Quecksilber und von Loesungen der Chloralkali Elektrolyse in Quecksilberbaedern (Dr. Pieper).
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3. Exacte Gasanalyse mit Hilfe der Drehschmidt-Apparatur. (Dr. Wetzel)
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4. Ueber die Stockapparatur und ihre Anwendung zur Trennung gasformiger Kohlenwasserstoffe. (Dr. Hicke)
   The Stock apparatus and its use for separation of gaseous hydrocarbons.

5. Trennung von Kohlenwasserstoffen mit Hilfe der Destillation. (Wetzel).
   Separation of hydrocarbons by distillation.

6. Anwendung und Entwicklung der Schwebewage. (Dr. Wetzel)
   Use and development of the suspension balance.

7. Gasanalytische Bestimmung von Butadien, Butylen, Butan, Wasserstoff, Acetylen und Monovinylacetylen nebeneinander. (Blumrich)
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8. Butadienbestimmung mit Maleinsaeuresanhydrid. (Dr. Wetzel)
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9. Schwefel- und Halogenbestimmung in Gasen. (Dr. Bens)
   Determination of sulfur and halogen in gases.

10. Ueber die Bestimmung von Spuren aromatischer Amine in der Luft von Betriebsraeumen (van Mulle)
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11. Ueber einen selbsttaetigen SO_2 Bestimmungsapparat. (Dr. Hake)
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12. Chromchlorueberlosung zur Absorption von Sauerstoff (Dr. Ehrhardt).
    Chromous chloride for absorption of oxygen.

13 Chlormagnesium zur trocknung von Sauerstoff (Dr. Ehrhardt)

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Geschaeftliche Lage der analytischen Laboratorien.
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Microanalysis at the analytic laboratory Oppau.

3. Entwicklung der Mikroelementaranalyse im Untersuchungslaboratorium Ludwigshafen. (Dr Zimmermann)

4. Erfahrungen mit der mikroanalytischen Sauerstoffbestimmung in organischen Substanzen nach der Methode von Ludwigshafen. (Dr. Unterzaucher).
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5. Ueber die Bestimmung von Schwermetallspuren mit Dithiozon in Duengmitteln und technischen produkten. (Dr. Abrahamczik).
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6. Quantitative Mikrobestimmung von Metallen in organischen Stoffen. (Dr. Kroecker).
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7 Die Bestimmung von Spurenelementen in organischen Stoffen, (Dr. Wurzschmitt).
Determination of trace elements in organic substances.

8 Spurensuche von Metallcarbonylen in der Luft, (Dr. Grassner).
Determination of traces of metal carbonyls in the air.

9 Bestimmung kleiner Mengen Kobalt in Kupferchloruerloesungen und Kupfersalzen. (Dipl-Ing. Ahrens)
Determination of small quantities of cobalt in cuprous chloride solutions and copper salt

10. Bestimmung von Spuren Gold in Erzen, (Dip-Ing. Ahrens)
Determination of traces of gold in ores.

11 Anwendungsmoeglichkeiten der elektrometrischen Messmethoden fuer Spurensuche, (Dr. Ehrhardt).
Applications of electrometric methods of measuring in microchemistry

12. Eine neue Ausfuehrungsform der Micro-molekular-gewichtsbestimmung nach Barger (Dr. Untersaucher).
New method of micro molecular weight determination by Barger)

13: Beitrag zur Geschichte der chromatographischen und Kapillaranalyse (Dr. Danz).
Contribution to history of chromatographic and capillary analysis.

Meeting 28, 3-14-40, Frankfurt 872-879

Geschaeftliche Lage der analytischen Laboratorien und Personalfragen.
Commercial status of the analytical laboratories and personnel questions.

Meeting	29, 10-29-40,	Ludwigshafen)	Geschaeftliche	880-885
"	30, 3-21-41,	Frankfurt)	Lage der analy-	886-896
"	31, 10-17-41	")	tischen	897-908
"	32, 3-20-42	")	Laboratorien.	909-910
"	33, 10-16-42	")		911-917
"	34, 3-19-43	")	Commercial	918-923
"	35, 3-17-44	")	position of the analytic laboratories.	924-932