



EXAMENSBEVIS

DEGREE CERTIFICATE

Chandra Sekhar Gahan

1980-01-22-8034

HAR PÅ FORSKARNIVÅ AVLAGT/
HAS BEEN AWARDED THE THIRD LEVEL

TEKNOLOGIE DOKTORSEXAMEN

DEGREE OF DOCTOR OF PHILOSOPHY (PhD)

INOM ÄMNET PROCESSMETALLURGI
IN THE SUBJECT PROCESS METALLURGY

Luleå tekniska universitet/*Luleå University of Technology*

Examensdatum/*Date of Graduation*

21 december 2009 / 21 December 2009

Johan Sterte
Rektor/President



EXAMENSBEVIS

DEGREE CERTIFICATE

CHANDRA SEKHAR GAHAN

1980-01-22-3034

Har den **21 december 2009**

avlagt **teknologie doktorsexamen** på forskarnivå omfattande **240 högskolepoäng** i enlighet med bestämmelserna i högskoleförordningen (SFS 1993:100 med ändring 2006:1053)

Has on **21 December 2009**

been awarded the third level **Degree of Doctor of Philosophy (PhD)** **240 higher education credits**, in accordance with the regulations governing Swedish Higher Education (SFS 1993:100 and the amendment 2006:1053)

Inom ämnet
In the subject

Processmetallurgi
Process Metallurgy

Och har författat och vid en offentlig disputation muntligen försvarat en vetenskaplig avhandling med titeln/
And has written and publicly defended a doctoral dissertation with the title

Möjligheten att använda oxidiska industriella biprodukter som neutraliseringsmedel samt effekterna av klorid på biooxidation
Possibilities to use Industrial Oxidic By-products as Neutralising Agent in Bioleaching and the Effect of Chloride on Biooxidation

Handledare/Supervisor

Professor/Professor Åke Sandström

Prov Examination	Högskolepoäng HE Credits	Examinator Examiner
Recent Developments in Flocculation and Dewatering of Mineral Dispersions <i>Recent Developments in Flocculation and Dewatering of Mineral Dispersions</i>	4.5	Doktor/Doctor Jonas Addai-Mensah
Instrumentell analys, Induktivt kopplad plasma (ICP) <i>Instrumental analysis, Inductively coupled plasma (ICP)</i>	3.7	Forskare/Researcher Dmitry Malinovsky
Instrumentell analys, Svepelektronmikroskopi (SEM) <i>Instrumental analysis, Scanning Electron Microscopy (SEM)</i>	3.7	Professor/Professor Jonas Hedlund
Hydrometallurgi <i>Hydrometallurgy</i>	3.8	Professor/Professor Åke Sandström
Instrumentell analys, Kärnmagn resonansspektroskopi (NMR) <i>Instrumental analysis, Nuclear magn reson spectroscopy (NMR)</i>	3.7	Professor/Professor Oleg Antzutkin
Research Methodology in Engineering <i>Research Methodology in Engineering</i>	7.5	Universitetsadjunkt/Lecturer Aditya Parida
High Temperature Materials <i>High Temperature Materials</i>	3.8	Professor/Professor Bo Björkman
Vetenskapligt skrivande inom naturvetenskap och teknik <i>Scientific Writing in natural and engineering sciences</i>	1.5	Professor/Professor Bengt Lundberg
Granskning av vetenskaplig publicering <i>Review of Scientific Publications</i>	3.0	Professor/Professor Anders Lagerkvist
Instrumentell analys, Röntgendiffraktion (XRD) <i>Instrumental analysis, X-ray diffraction (XRD)</i>	3.7	Professor/Professor Jonas Hedlund
Asset Engineering & Management <i>Asset Engineering & Management</i>	7.5	Universitetsadjunkt/Lecturer Aditya Parida
Performance Measurement and Management <i>Performance Measurement and Management</i>	7.5	Universitetsadjunkt/Lecturer Aditya Parida
Instrumentell analys, IR-,RA- UV- spektroskopi <i>Instrumental analysis, IR-,RA- UV- spectroscopy</i>	3.7	Docent/Associate Professor Allan Holmgren

Prägel/University Stamp
(Framträder ej på kopia)/
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Sign


EXAMENSBEVIS

DEGREE CERTIFICATE

CHANDRA SEKHAR GAHAN 1980-01-22-3034

Prov <i>Examination</i>	Högskolepoäng <i>HE Credits</i>	Examinator <i>Examiner</i>
Instrumentell analys , Termisk analys (TA) <i>Instrumental analysis , Thermal Analysis (TA)</i>	3.7	Professor/ <i>Professor</i> Jonas Hedlund
Avhandlingspoäng <i>Thesis work</i>	180.5	Professor/ <i>Professor</i> Åke Sandström
Summa/ <i>Total sum</i>	241.8 högskolepoäng/ <i>HE Credits</i>	

Luleå 21 december 2009 / 21 December 2009


Ann-Sofie Andersson
Examenshandläggare/ *Degree Evaluation Officer*


60 högskolepoäng motsvarar ett års heltidsstudier.
60 Higher Education Credits (HE Credits) are equivalent to one academic year of fulltime studies.

Betygsgrad/ *The Grades:*

För denna prov ges endast betyget "Godkänd"/ *The only grade awarded is "Pass".*

Prägel/ *University Stamp*
(Framträder ej på kopia)/
(*Does not appear on the copy*)

LULEÅ
TEKNISKA
UNIVERSITET

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DIPLOMA SUPPLEMENT

This Diploma Supplement model was developed by the European Commission, Council of Europe and UNESCO-CEPES. The purpose of the supplement is to provide sufficient independent data to improve the international "transparency" and fair academic and professional recognition of qualifications (diplomas, degrees, certificates etc.). It is designed to provide a description of the nature, level, context, content and status of the studies that were pursued and successfully completed by the individual named on the original qualification to which this supplement is appended. It should be free from any value-judgements, equivalence statements or suggestions about recognition. Information in all eight sections should be provided. Where information is not provided, an explanation should give the reason why.

1. INFORMATION IDENTIFYING THE HOLDER OF THE QUALIFICATION

1.1 Family name:

Gahan

1.2 Given name:

Chandra Sekhar

1.3 Date of birth (day/month/year):

22 January 1980

1.4 Civic registration number:

800122-3034

2. INFORMATION IDENTIFYING THE QUALIFICATION

2.1 Date of issue:

21 December 2009

2.2 Name of qualification and (if applicable) title conferred (in original language):

Teknologie doktorsexamen

2.3 Name of qualification and (if applicable) title conferred in official translation to English:

Degree of Doctor of Philosophy (PhD)

2.4 Main field(s) of study for the qualification:

Process Metallurgy

2.5 Name (in original language) and status of awarding institution:

Luleå tekniska universitet (state higher education institution with status of university)

2.6 Name (in original language) and status of institution (if different from 2.5) administering studies:

Not applicable.

2.7 Language(s) of instruction:

Mainly English

3. INFORMATION ON THE LEVEL OF THE QUALIFICATION

3.1 Level of qualification:

Third level higher education.

For more information on higher education in Sweden, please see point 8.

3.2 Official length of programme:

The Degree of Doctor requires 240 higher education credits.

The scope of the education is to be indicated in higher education credits, with full-time studies for a normal 40-week academic year corresponding to 60 higher education credits.
(HEO Chapter 6, Section 2)

3.3 Access requirement(s):

The requirements (after 1 July 2007) for admission to doctoral studies

(HEO Chapter 7, Section 39)

A person has basic eligibility for third level education if he or she

- has taken a second level qualification,
- has completed course requirements of at least 240 higher education credits, including at least 60 higher education credits at second level, or
- has acquired essentially corresponding knowledge in some other way in Sweden or abroad.

The faculty board may permit an exemption from the requirement of basic eligibility in the case of an individual applicant, if there are special grounds.

The requirements (before 1 July 2007) for admission to doctoral studies

1. has basic eligibility and the special eligibility that the faculty board may have prescribed, and
2. is deemed to have the ability in other respects that is needed to benefit from the education.

For admission to doctoral programme undergraduate qualifications of at least 120 credit points (corresponding to 180 higher education credits) are required. Furthermore, the appropriate faculty board may stipulate additional requirements for admission.

Admission to postgraduate studies after 1 July 2007 can be accepted according to the requirements above (before 1 July 2007) until year 2015.

Local requirements

The specific eligibility for every subject, in which post-graduate studies are offered, is made clear in a general study plan that is determined by the Faculty Board at Luleå University of Technology.

4. INFORMATION ON THE CONTENTS AND RESULTS GAINED

4.1 Mode of study:

Full-time equivalent.

4.2 Degree requirements:

Degree of Doctor (Doktorsexamen)

(HEO appendix 2)

Scope

A degree of Doctor is obtained after the research student has completed an educational programme of 240 higher education credits in a subject of education at the third level of higher education.

Objectives

Knowledge and understanding

For a degree of Doctor Research students must

- demonstrate broad knowledge in and a systematic understanding of the field of research, together with deep and up-to-date specialist knowledge in a defined part of the field of research; and
- demonstrate familiarity with scholarly methods in general and with methods in the specific field of research in particular.

Skills and abilities

For a degree of Doctor Research students must

- demonstrate an ability to engage in scholarly analysis and synthesis and in independent, critical examination and assessment of new and complex phenomena, issues and situations;

- demonstrate an ability to identify and formulate issues, critically, independently and creatively, and proceeding with scientific precision, and to plan and, using appropriate methods, conduct research and other advanced tasks within specified time limits, and to scrutinise and evaluate such work;
- demonstrate, in a dissertation, their ability to make a substantial contribution to the development of knowledge by their own research;
- demonstrate an ability to present and discuss research and research results with authority, in dialogue with the scholarly community and society in general, orally and in writing, in both national and international contexts;
- demonstrate an ability to identify their need of further knowledge; and
- demonstrate a potential to contribute to the development of society and support other people's learning, both in the field of research and education and in other advanced professional contexts.

Judgement and approach

For a degree of Doctor Research students must

- demonstrate intellectual independence and scholarly integrity and an ability to make ethical assessments relating to research; and
- demonstrate deeper insight into the potential and limitations of scholarship, its role in society and people's responsibility for how it is used.

Scholarly dissertation (doctoral dissertation)

For a degree of Doctor the research student must have received a passing grade on a scholarly dissertation (doctoral dissertation) worth at least 120 higher education credits.

Other

For a degree of Doctor with a certain area of specialisation more precise requirements are also to apply, as determined by each higher education institution itself within the framework of the requirements in this qualification description.

Local requirements

A doctorate is attained upon completion of a programme of at least 240 credits in a subject. The goals for a doctorate are to have been attained and an academic thesis of a least 120 credits shall have been approved. The doctoral thesis shall have been orally defended in public.

There shall be a general study programme determined by the Faculty Board for every subject in which post-graduate studies are offered (HEO Chapter 6, Section 34). This general study programme shall state the programme's contents and arrangement, the specific admission requirements, the bases for assessment that apply in respect of selection for admission to the programme, the examinations included in the programme, and whether it is possible conclude part of the programme with a licentiate degree.

4.3 Programme details (e.g. modules or units studied), and the individual grades/marks/credits obtained:

See Degree Certificate

4.4 Grading scheme and, if available, grade distribution guidance:

See Degree Certificate

4.5 Overall classification of the qualification (in original language):

Not applicable for Swedish degrees.

5. INFORMATION ON THE FUNCTION OF THE QUALIFICATION

5.1 Access to further study:

Not applicable

5.2 Professional status (if applicable):

No special information is indicated; gives access to employment.

6. ADDITIONAL INFORMATION

6.1 Additional information:

None.

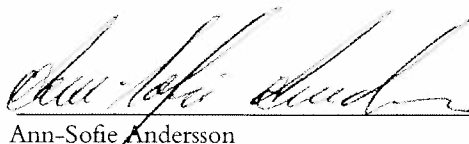
6.2 Further information sources:

Luleå University of Technology
SE-971 87 Luleå
Phone: +46(0)920-49 10 00
Fax: + 46(0)920-49 13 99
<http://www.ltu.se>

Swedish National Agency for Higher Education
the Swedish ENIC/NARIC Office
Box 7851
SE-103 99 Stockholm
<http://www.hsv.se>

7. CERTIFICATION OF THE SUPPLEMENT**7.1 Date:**

21 December 2009

7.2 Signature and official stamp or seal (if used)

Ann-Sofie Andersson

**7.3 Capacity:**

Administrative Assistant

8. INFORMATION ON THE NATIONAL HIGHER EDUCATION SYSTEM

Information on the Swedish higher education system of enclosure