AUSTENITE PROCESSING IN NIOBIUM MICROALLOY STEELS

The Royal Society, London

Wednesday 13th July 2011

CBMM

beta technology

AUSTENITE PROCESSING IN NIOBIUM MICROALLOY STEELS

Dr Bob Keown OBE

- A seminar recognising Chinese contributions to Steel Processing
- A presentation of the 2011 Charles Hatchett Award – winning Paper

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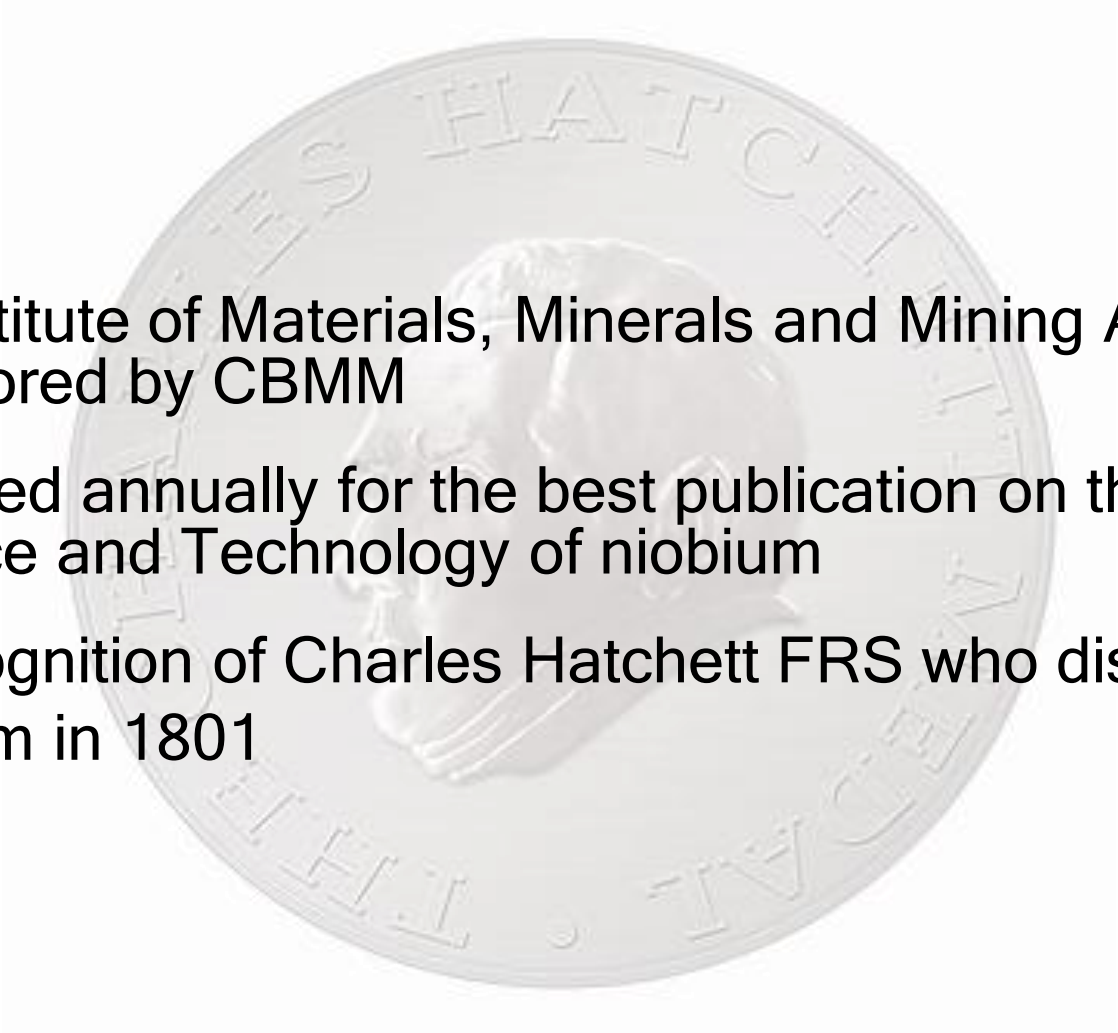
CHARLES HATCHETT AWARD



- An Institute of Materials, Minerals and Mining Award sponsored by CBMM
- Awarded annually for the best publication on the Science and Technology of niobium
- In recognition of Charles Hatchett FRS who discovered niobium in 1801

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CBMM
Companhia Brasileira de Metalurgia e Mineração

- World's largest producer of niobium
- Private Brazilian company
- Sponsor of Charles Hatchett Award since 1979
- Worldwide collaborations with Steel Companies, Universities, Research Institutes and Professional Bodies

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NIOBIUM IN STEEL

41
Nb
Niobium
92.9

- 80% of niobium is used in High Strength Low Alloy Steels (also called Microalloy Steels)
- 0.04% niobium has a very large effect on steel properties (40gm niobium in 1 ton of steel)
- Microalloy steels introduced 50 years ago with pioneering research in Sheffield

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EFFECTS OF NIOBIUM IN MICROALLOY STEELS

Mechanical Properties

- Increased Strength
- Increased Toughness
- Good Ductility
- Good Weldability

Physical Metallurgy

- Grain Refinement
- Precipitation Hardening
- Increased Hardenability
- Lower Transformation Temperatures
- Facilitates High Temperature Processing
- (AUSTENITE PROCESSING)

PRECIPITATE PARTICLES OF NIOBIUM CARBIDE
NIOBIUM IN SOLID SOLUTION

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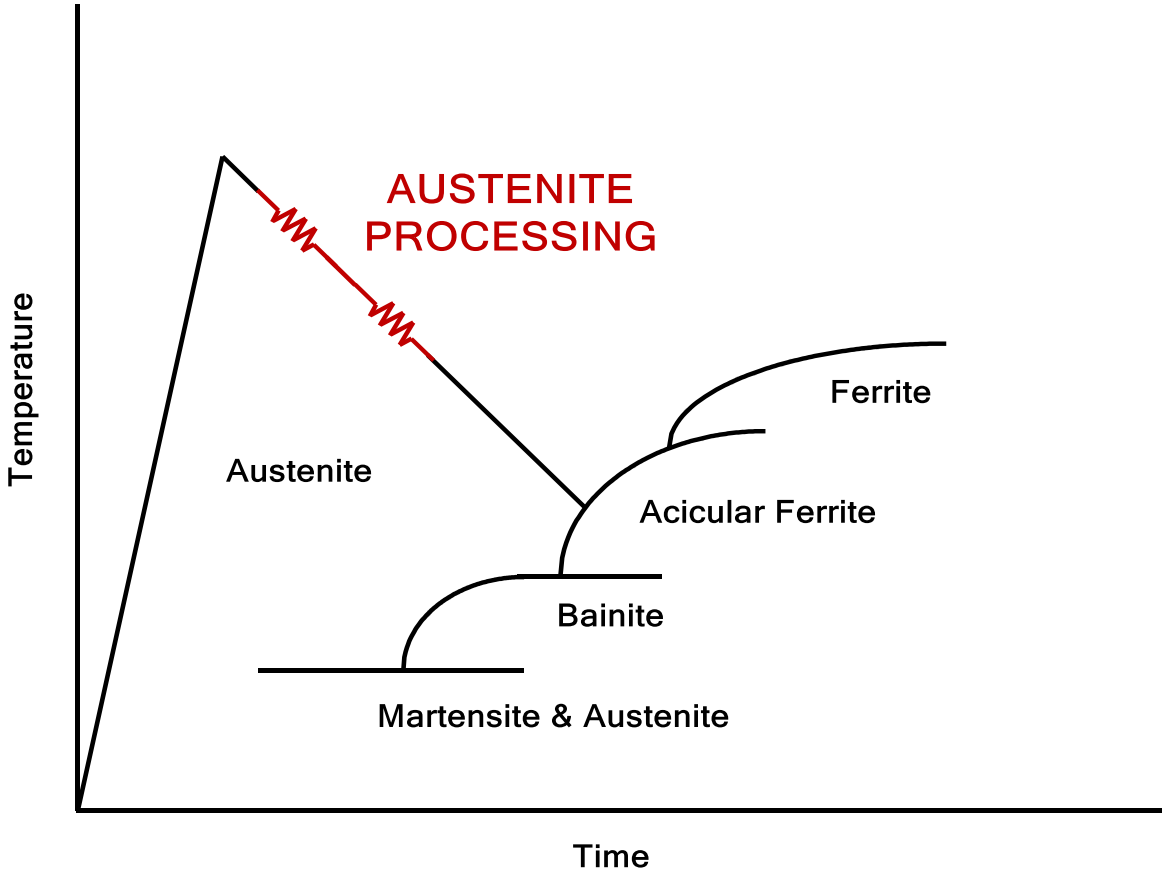
AUSTENITE PROCESSING



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CHARLES HATCHETT AWARD 2011 EVENTS

Tuesday 12th July

- Institute of Materials, Minerals and Mining Annual Dinner and Awards Ceremony
- Presentation of Charles Hatchett Award Medals

Wednesday 13th July a.m.

- Seminar on Austenite Processing
- Recognising Chinese contributions to Steel Processing

Wednesday 13th July p.m.

- Round Table Discussion on Austenite Processing
- 14 International Experts from 9 Countries

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AGENDA

10.25	Welcome and Introduction	Dr Bob Keown OBE Beta Technology, UK
10.35	The Royal Society	Professor Geoffrey Greenwood FRS University of Sheffield, UK
10.45	Keynote Lecture A Chinese and Brazilian Historical Perspective	Dr Malcolm Gray Microalloyed Steel Institute, USA
11.05	2011 Charles Hatchett Award Lecture Processing of High Niobium Line Pipe Steel and Chinese Developments	Professor Mani Subramanian McMaster University, Canada Professor C J Shang University of Beijing, China
11.35	China - Britain Business	Sir David Brewer Chair of China - Britain Business Council, UK
11.45	Coffee	
12.05	New Microalloyed Steels for Forgings	Professor Wolfgang Bleck RWTH Aachen University, Germany
12.25	The Emergence of Niobium in Asia	Dr Tadeu Carneiro CBMM, Brazil
12.45	Professional and Educational Partnerships between CBMM and IOM3	Dr Bernie Rickinson Institute of Materials, Minerals and Mining (IOM3)
12.55	Concluding Remarks	Dr Marcos Stuart CBMM, Brazil
13.00	Lunch	