

Geological Society of America

Penrose Medal 2010



Eric J. Essene (1939-2010)

Gold Medal Lecture, Presented at GSA, Denver, Oct. 31, 2010, J.W. Valley



~1957, Lexington, KY | to r: Eric, Molly, Edna, Frank, and Karen Essene

WASHING MACHINES— Coach Donn Hollingsworth wears a pleased smile above the well-washed Lafayette swimmers who churned up 62 points in the Memorial Coliseum pool to finish as runners-up to Louisville St. Xavier in Class A in the annual state high school splash meet here Saturday. (Leader photo).



THE LEXINGTON LEADER

Sports — General News

Monday Afternoon, April 4, 1955

LAFAYETTE SWIMMERS, second in the state high school meet. Front row (from left)—Robert Fraser, Robin Maggard, Roger Wesley Roberts and Ray Eppley; middle row—Dave Davis, Portmann, Tim Thompson, Charles Wigglesworth and Eric E back row—Tom Thompson, Ken Honican, Charles Letchworth, Ronnie Honican. Fraser, Eppley, Ken Honican and Letchworth up the winning team in the Class A 200-yard freestyle relay.





Top: Eric & Gail; Rt: Michelle, Eric, Ren
Below: Ren, Eric, Michelle





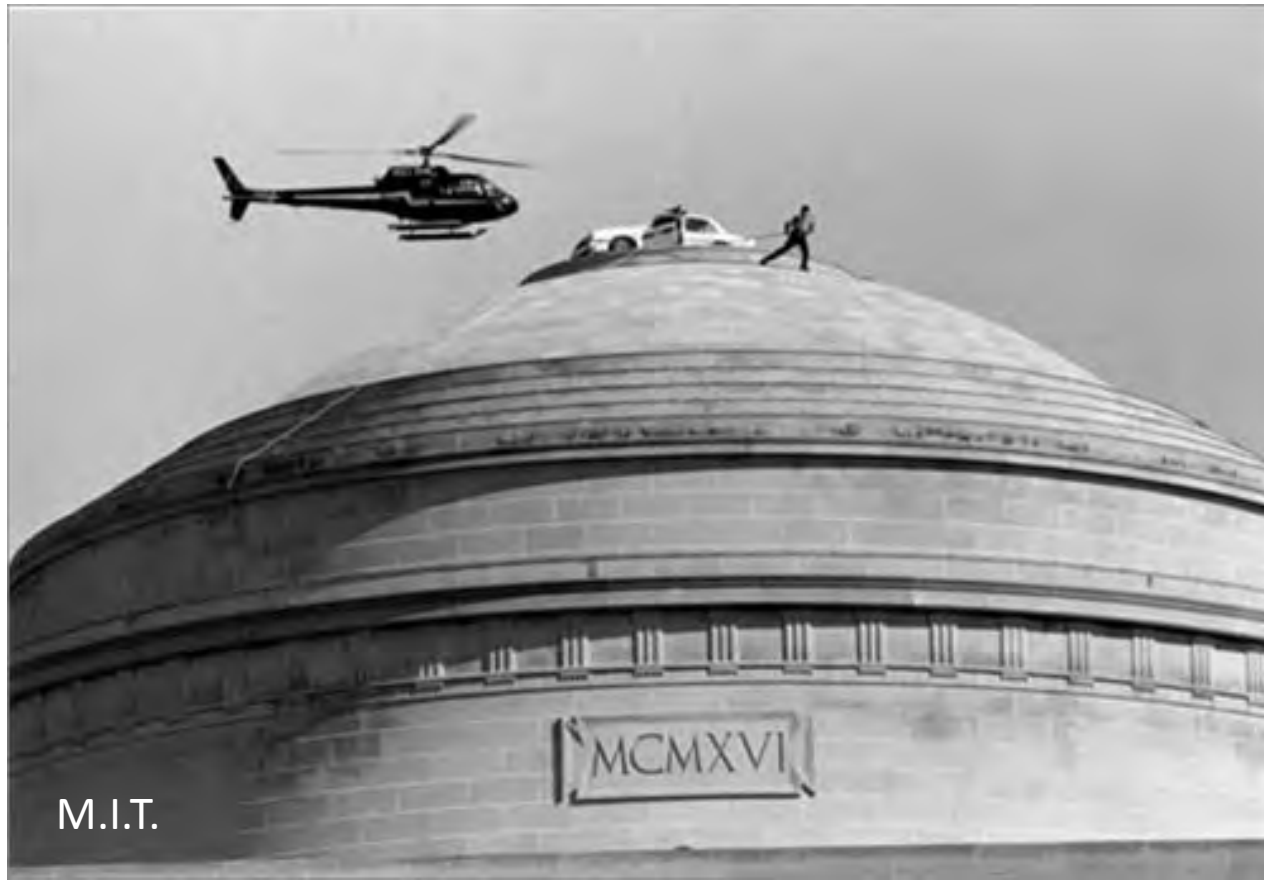
Eric & Joyce



Eric, Joyce, Adam, Zach







BSc 1961 Massachusetts Institute of Technology

Advisors: W.H. Dennen, H.W. Fairbairn

Thesis: *The Nahant Gabbro*

PhD 1967 University of California, Berkeley
 Thesis: *Petrogenesis of Franciscan Metamorphic Rocks*
 Advisors: W.S. Fyfe, F.J. Turner

Contr. Mineral. and Petrol. 15, 1—23 (1967)

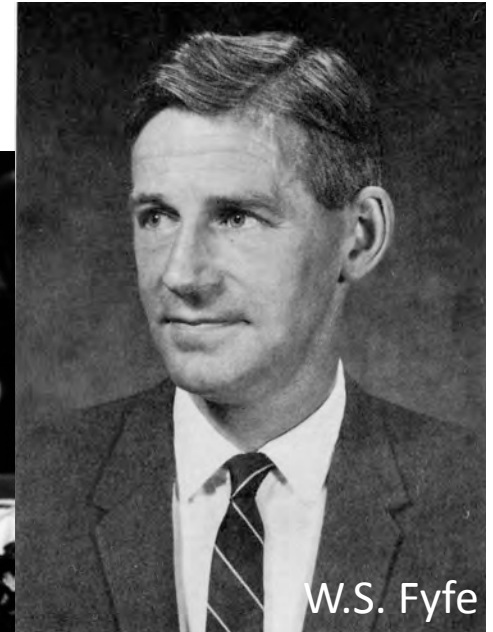
Omphacite in Californian Metamorphic Rocks

E. J. ESSENE and W. S. FYFE

Department of Geology and Geophysics, University of California, Berkeley,
 and Department of Geology, Manchester University



F.J. Turner



W.S. Fyfe

Essene & Fyfe 1967

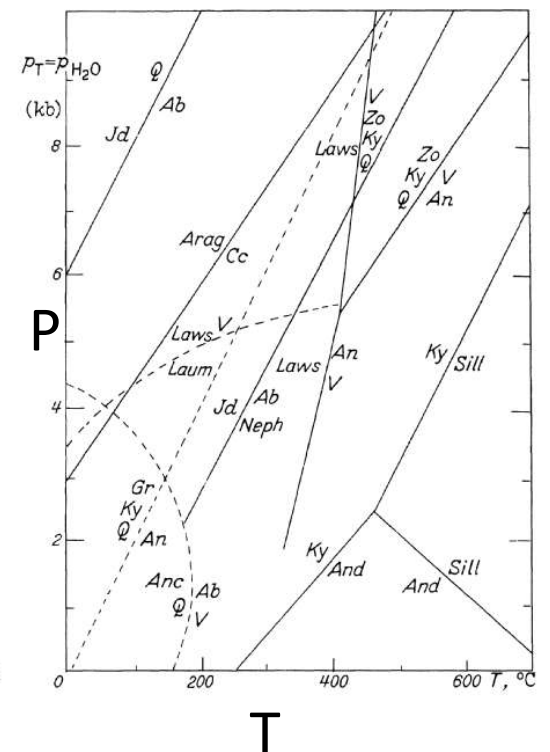
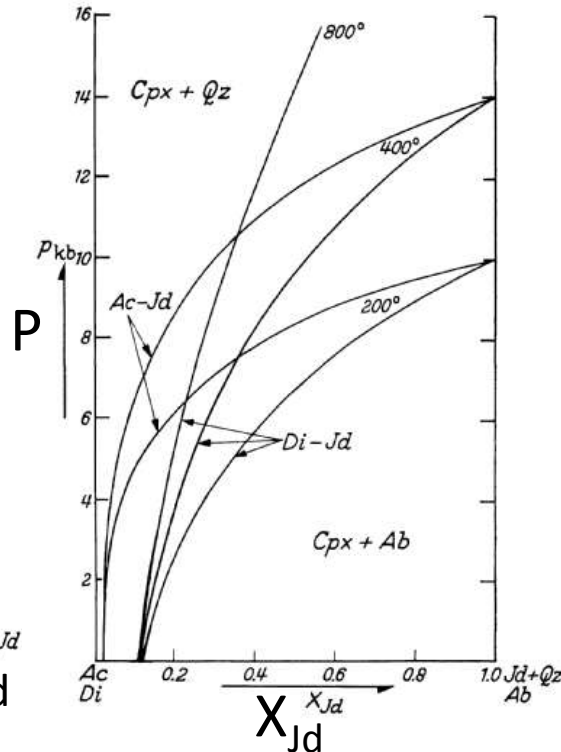
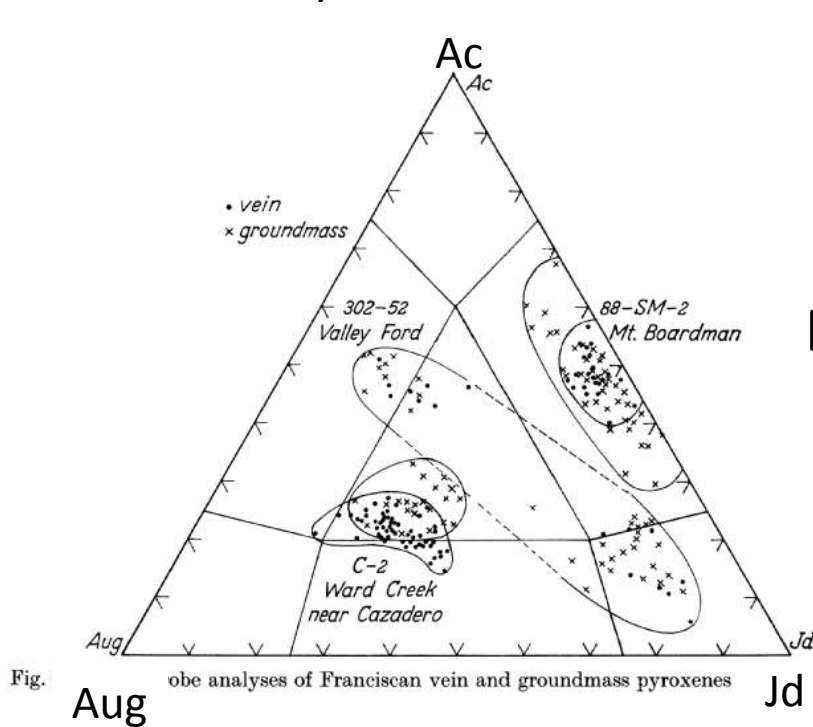


Fig. 1. Ternary diagram showing omphacite analyses of Franciscan vein and groundmass pyroxenes

1966-68 NSF Post-doctoral Fellow, Cambridge University, S.E. Agrell, C.E. Tilley

1968-70 Research Fellow, ANU, D.H. Green, A.E. Ringwood

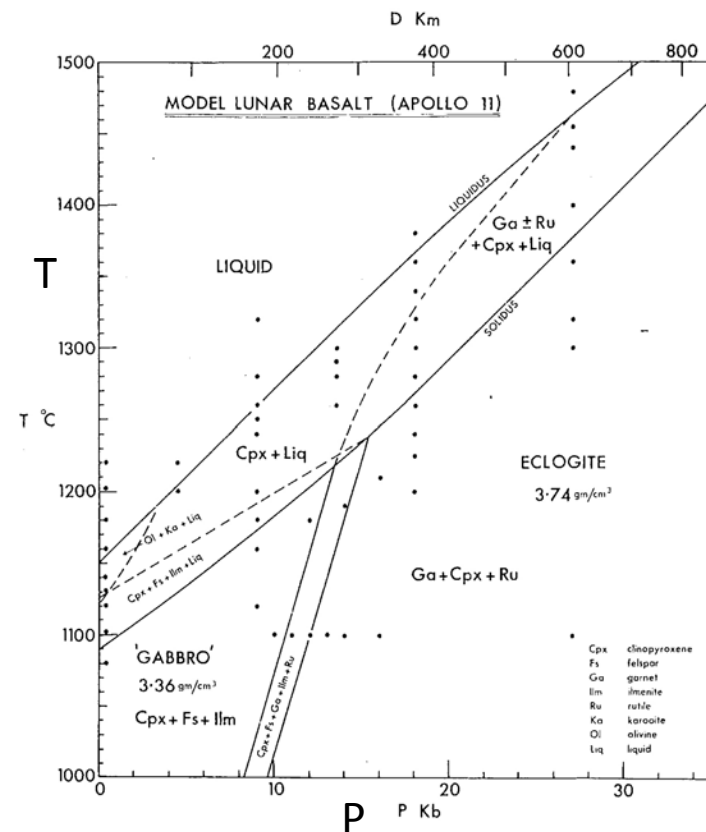
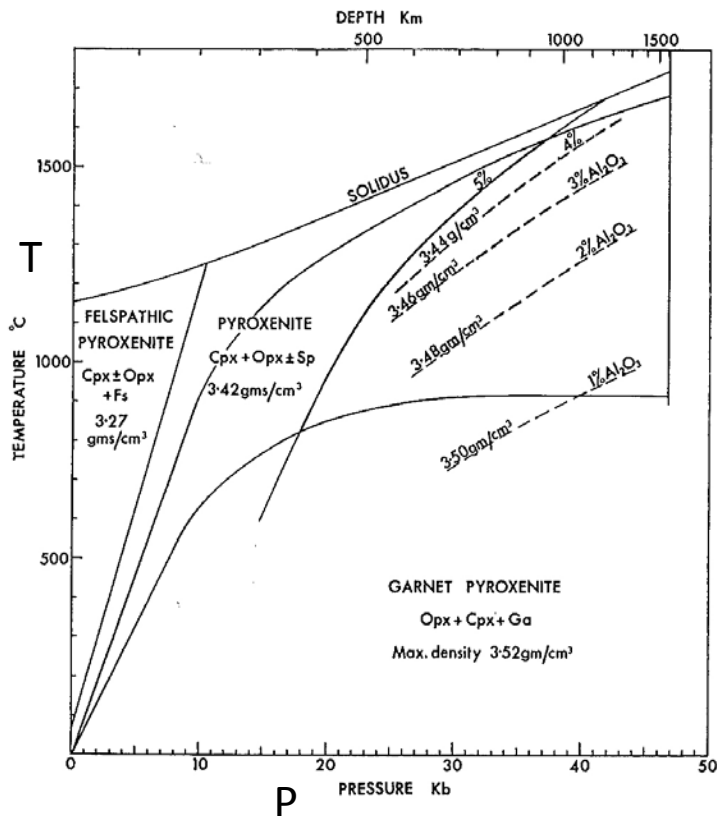
Petrology of the lunar rocks from Apollo 11 landing site

E. J. ESSENE, A. E. RINGWOOD and N. G. WARE

Petrogenesis of Apollo 11 basalts, internal constitution and origin of the moon

Science 1970, LSC 1970

A. E. RINGWOOD and E. ESSENE



1970- 2010 Professor, University of Michigan

1991 Sokol Award for excellence in graduate education



L to R: J. Valley, L. Anovitz, J. Bowman, J. Geissman, R. Shedlock, S. Bohlen, J. Ruiz, D. Perkins,
E. Essene, P. Brown, A. Treiman, E. Peterson

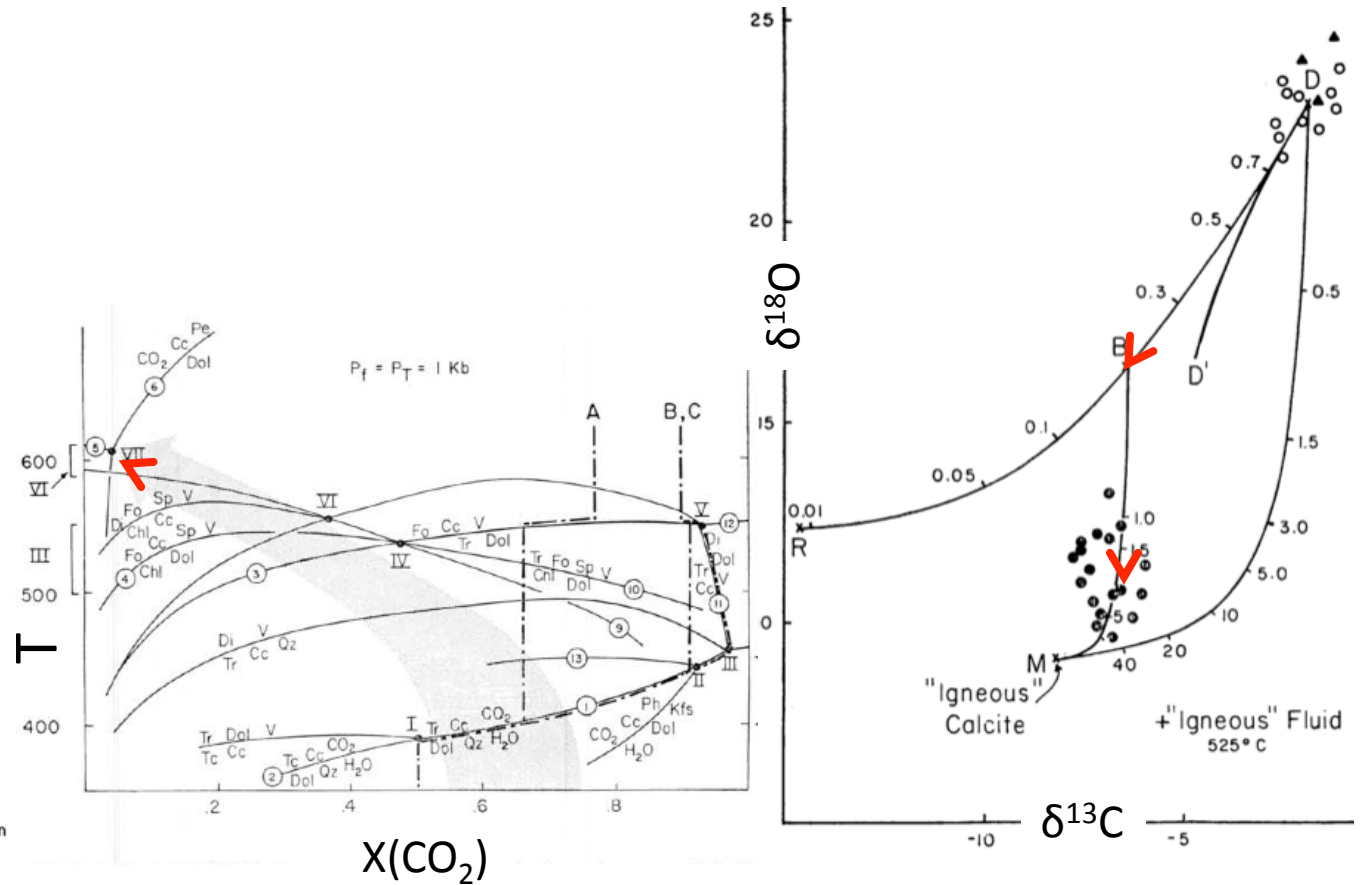
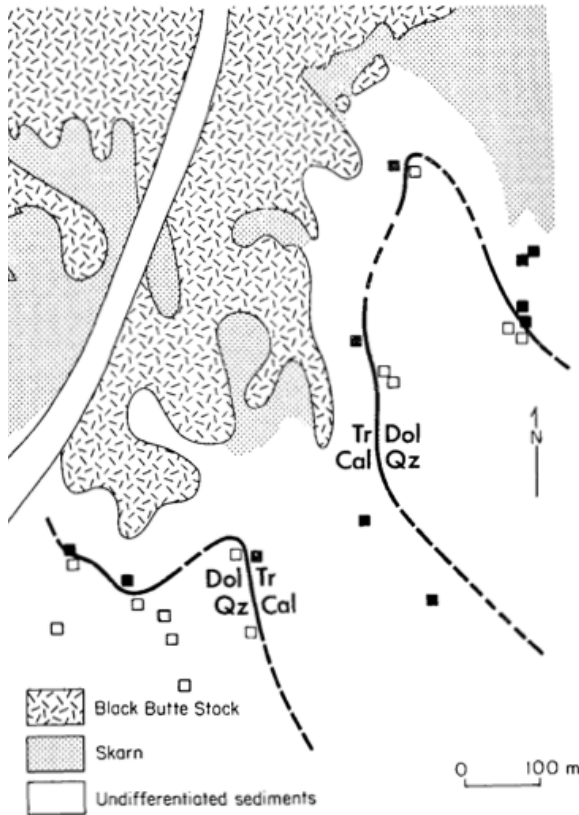
John Bowman PhD 1977

[AMERICAN JOURNAL OF SCIENCE, VOL. 285, SEPTEMBER, 1985, P. 621-660]

CONTACT SKARN FORMATION AT ELKHORN, MONTANA.

II: Origin and Evolution of C-O-H Skarn Fluids†

JOHN R. BOWMAN*, JAMES R. O'NEIL**, and ERIC J. ESSENE



Phil Brown PhD 1980

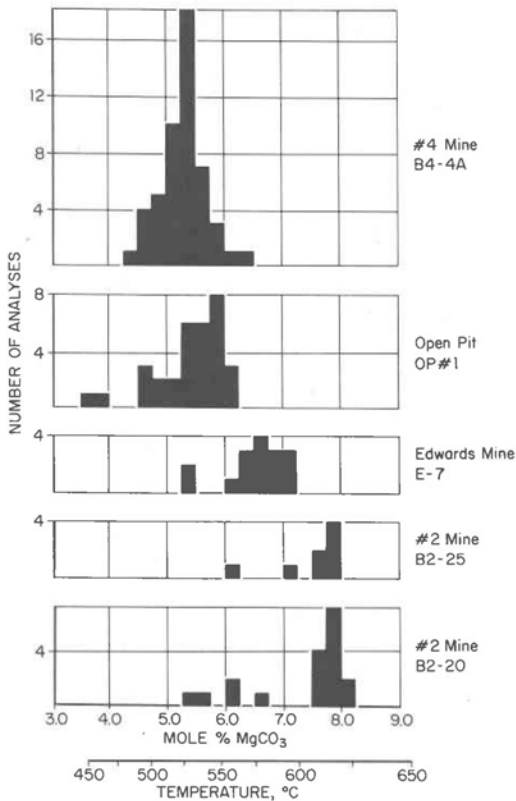
American Mineralogist 1978

Sphalerite geobarometry in the Balmat-Edwards district, New York

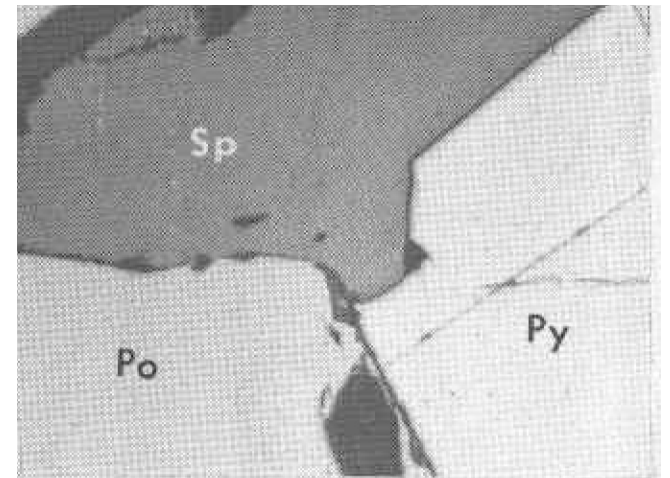
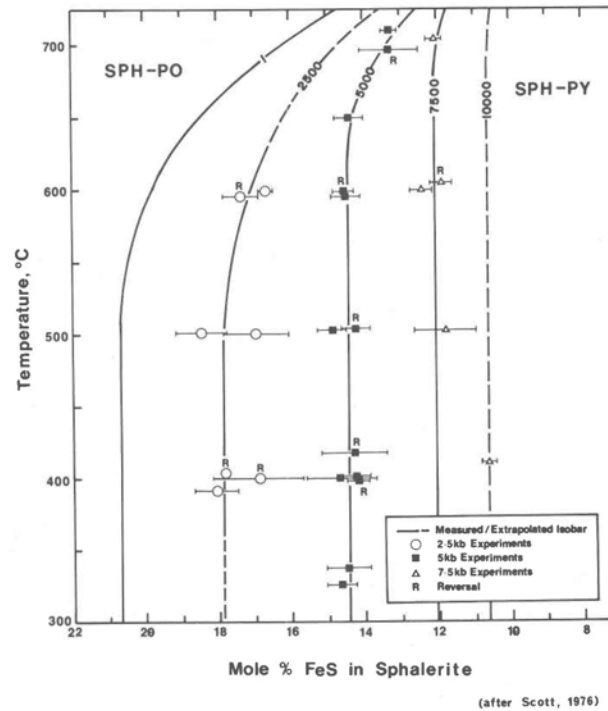
P. E. BROWN, E. J. ESSENE AND W. C. KELLY

Department of Geology and Mineralogy
The University of Michigan, Ann Arbor, Michigan 48109

Calcite+Dolomite



Sphalerite+Pyrite+Pyrrhotite

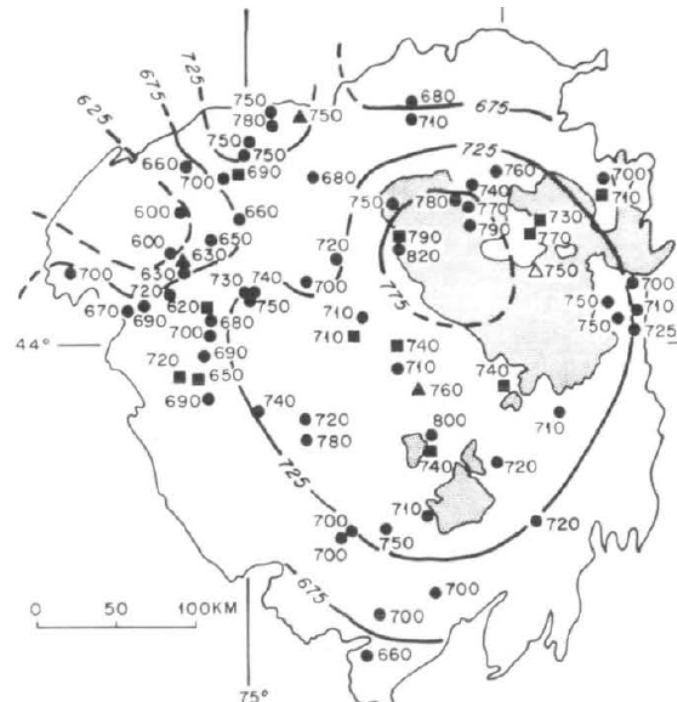


Steve Bohlen PhD 1979

Metamorphism in the Adirondacks. I. Petrology, Pressure and Temperature*

Journal of Petrology 1985

by STEVEN R. BOHLEN,¹ JOHN W. VALLEY,² AND ERIC J. ESSENE³



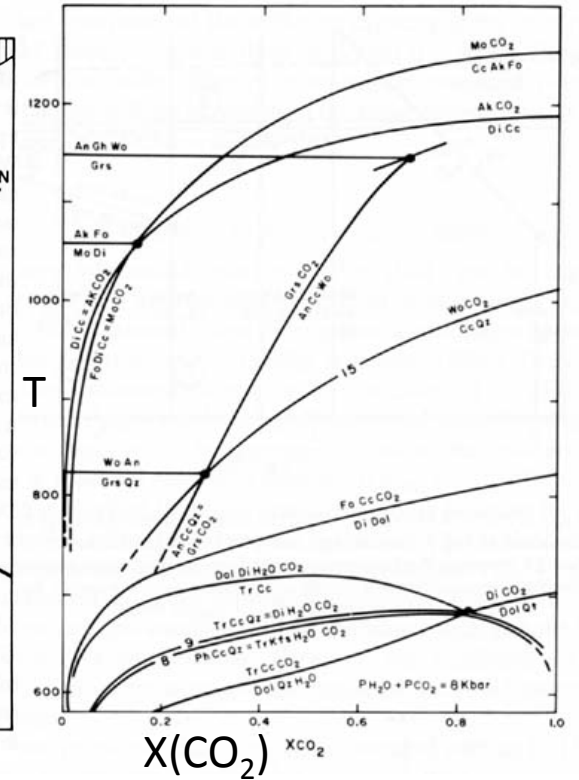
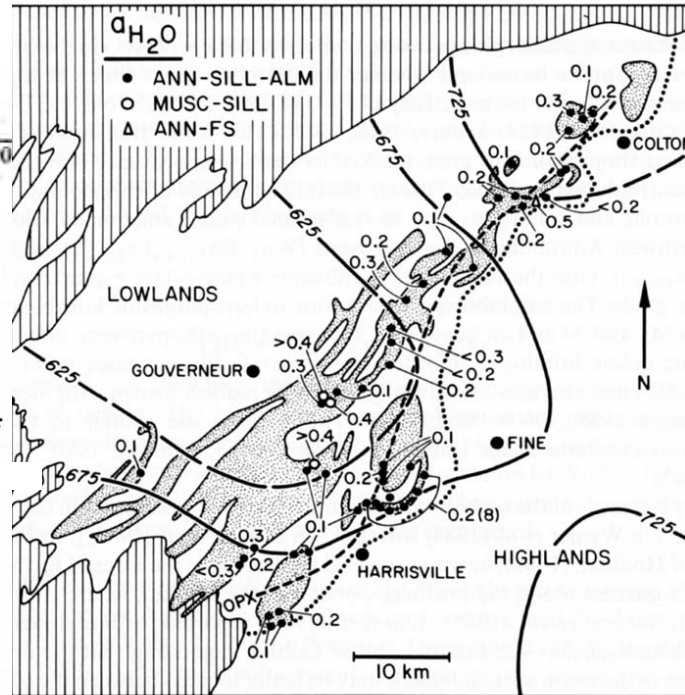
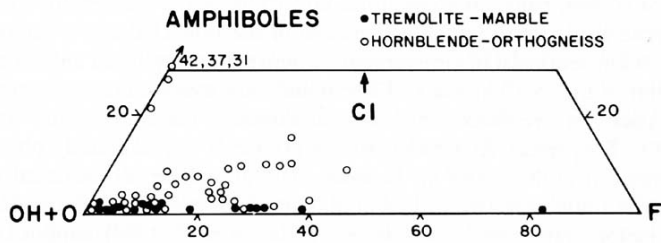
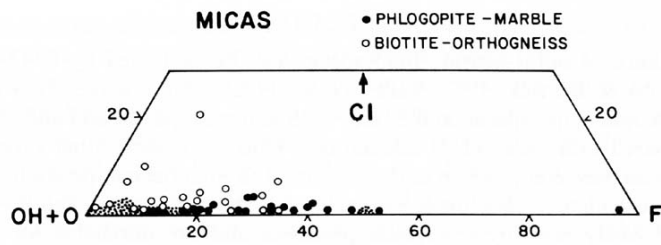
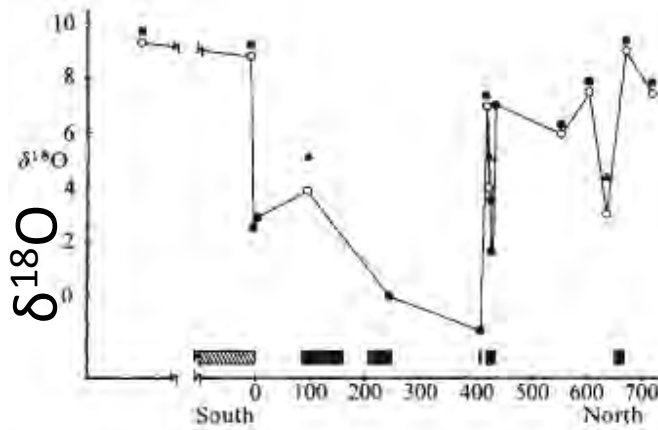
John Valley PhD 1980

Metamorphism in the Adirondacks: II.

The Role of Fluids

Journal of Petrology 1990

by JOHN W. VALLEY¹, STEVEN R. BOHLEN², ERIC J. ESSENE³
WILL LAMB⁴



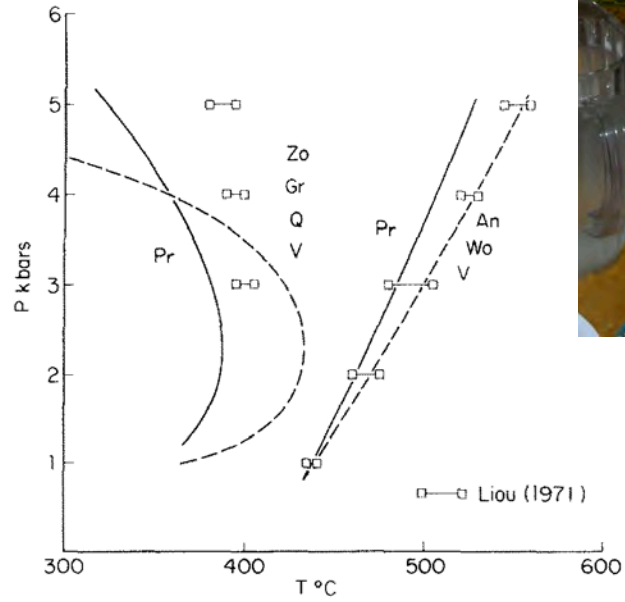
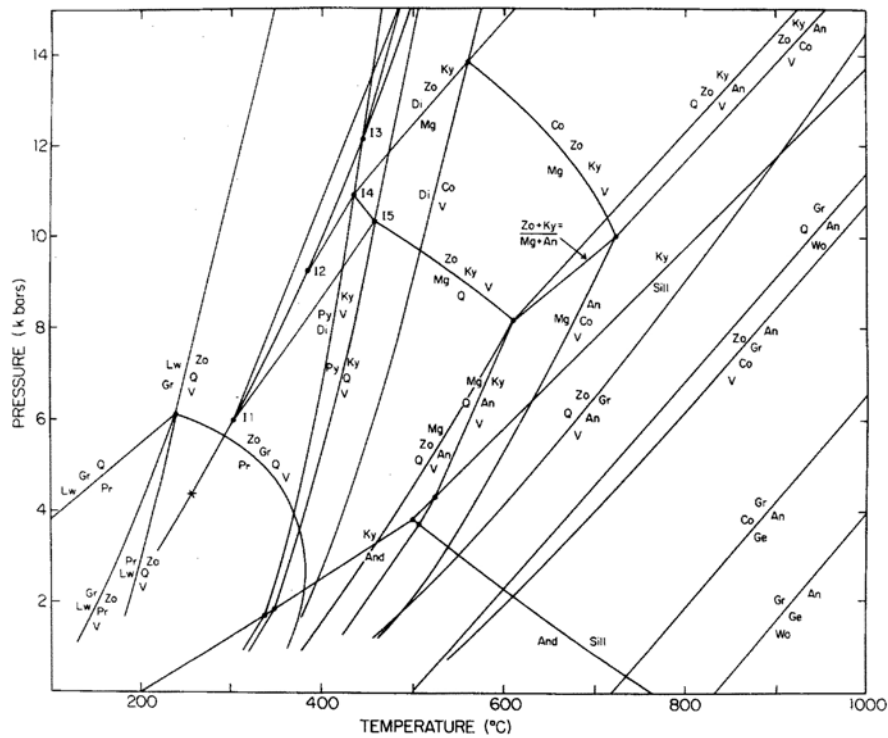
Dexter Perkins PhD 1981

Geochimica et Cosmochimica Acta Vol. 44, pp. 61 to 84
© Pergamon Press Ltd. 1980. Printed in Great Britain

0016-7037/80/0101-00

The thermodynamic properties and phase relations of some minerals in the system $\text{CaO-Al}_2\text{O}_3\text{-SiO}_2\text{-H}_2\text{O}^*$

Perkins, Westrum & Essene 1980



Allan Treiman PhD 1982

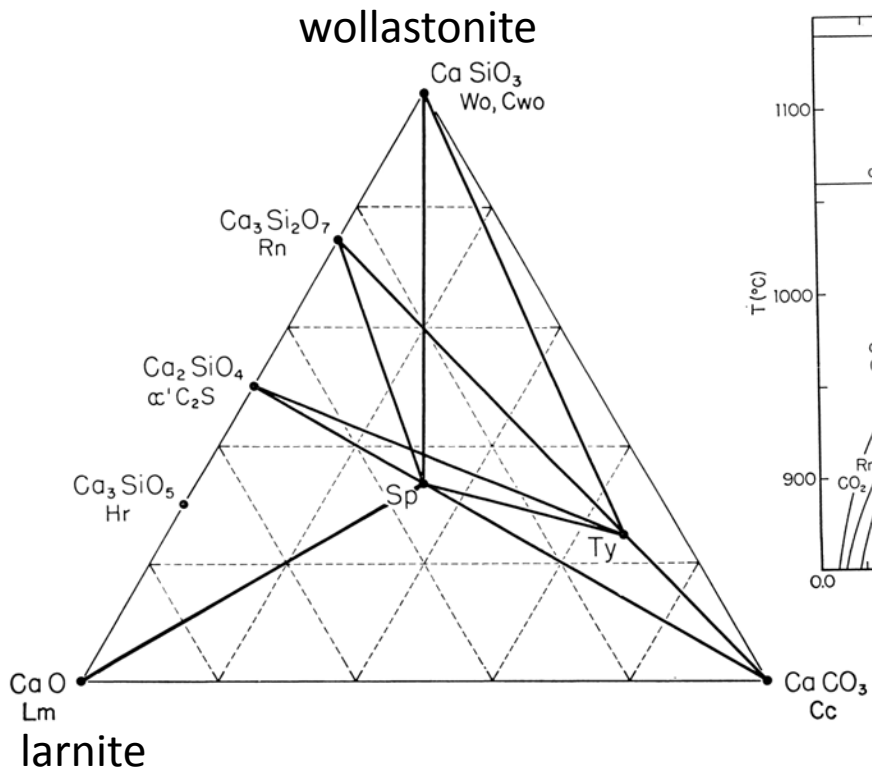
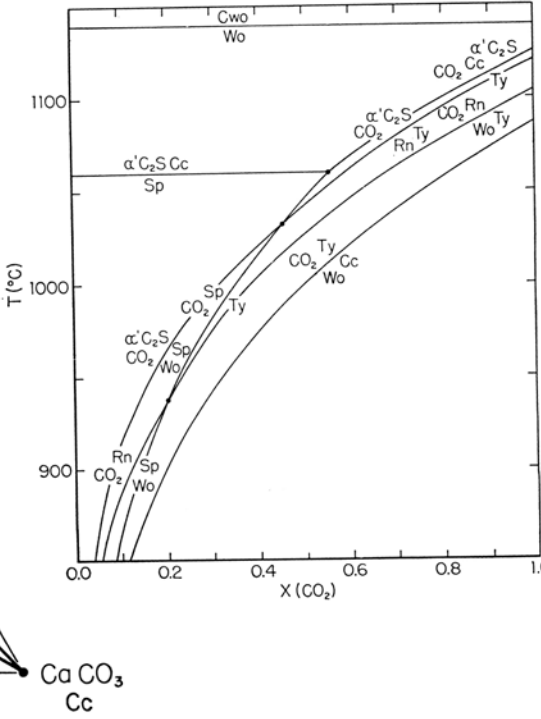
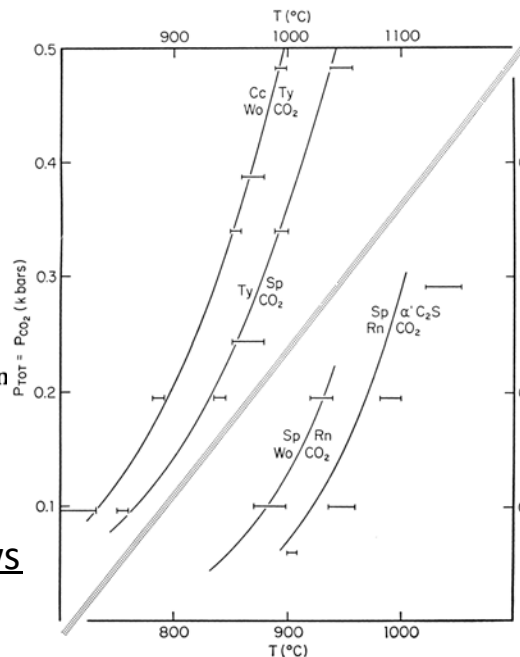
[AMERICAN JOURNAL OF SCIENCE, VOL. 283-A, 1983, P. 97-120]

**PHASE EQUILIBRIA IN THE SYSTEM
CaO-SiO₂-CO₂**

A. H. TREIMAN and E. J. ESSENE

Department of Geological Sciences, The University of Michigan
Ann Arbor, Michigan 48109

Tremble For Dire Peril [Walks](#)
Monstrous Acrimony Spurning Mercy's [Laws](#)
NL Bowen 1940

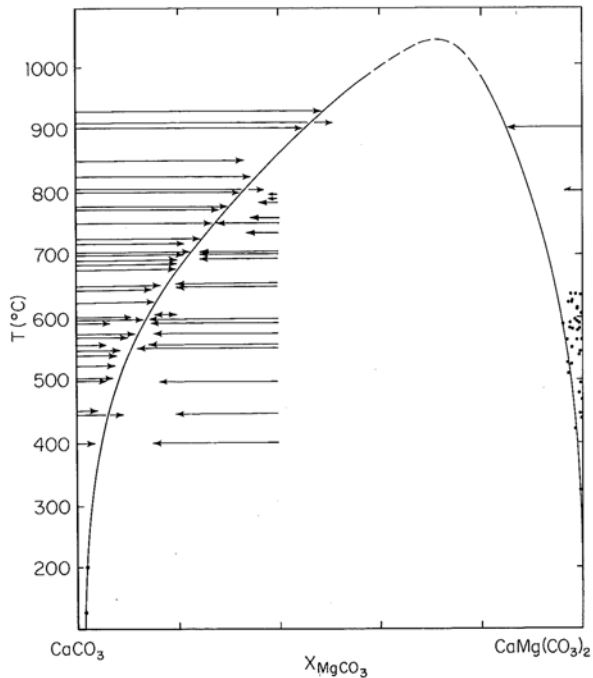
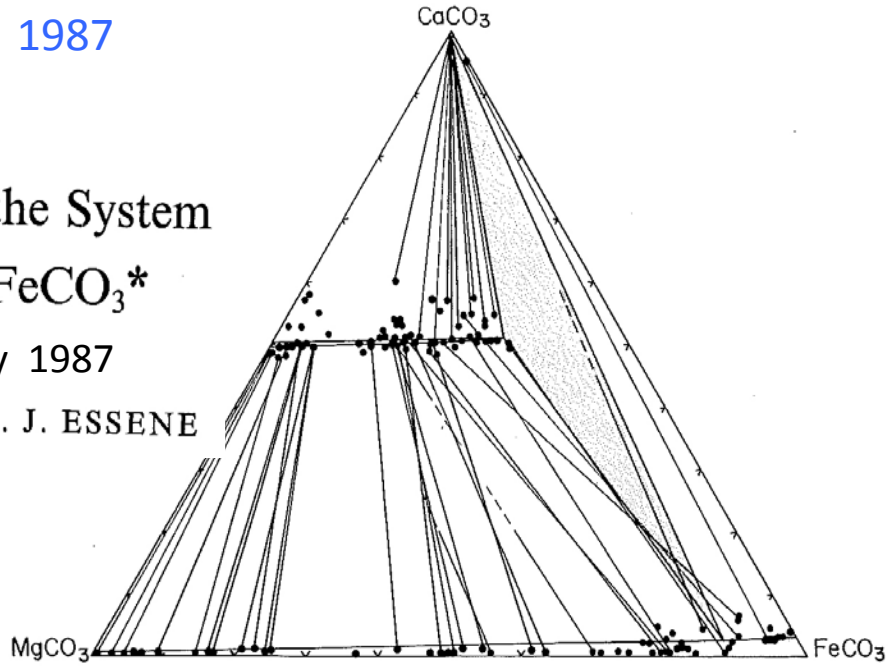


Larry Anovitz PhD 1987

Phase Equilibria in the System CaCO₃-MgCO₃-FeCO₃*

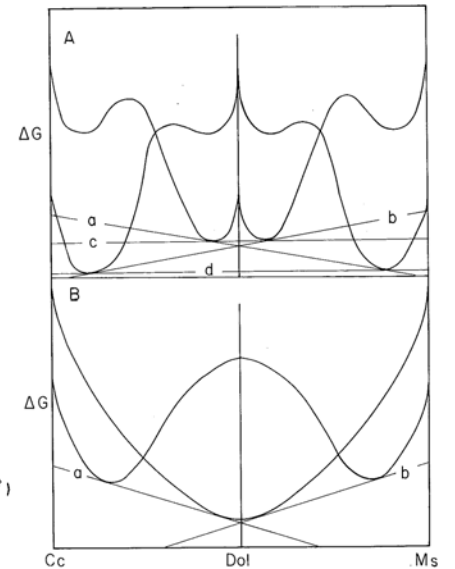
Journal of Petrology 1987

by L. M. ANOVITZ AND E. J. ESSENE



$$\Delta G_{Dol-Cc}^{MgCO_3} = RT \ln \left[\frac{X_{Cc}^{MgCO_3}}{X_{Dol}^{MgCO_3}} \right] + ((X_{Cc}^{FeCO_3})^2 (W_{Cc}^{MgFe} + 2X_{Cc}^{MgCO_3} (W_{Cc}^{FeMg} - W_{Cc}^{MgFe}))) + (X_{Cc}^{CaCO_3})^2 (W_{Cc}^{MgCa} + 2X_{Cc}^{MgCO_3} (W_{Cc}^{CaMg} - W_{Cc}^{MgCa}))) + (X_{Cc}^{FeCO_3}, X_{Cc}^{CaCO_3}) \{ (W_{Cc}^{FeMg} + W_{Cc}^{MgFe} + W_{Cc}^{CaMg} + W_{Cc}^{MgCa} - W_{Cc}^{FeCa} - W_{Cc}^{CaFe}) \} / 2 + X_{Cc}^{MgCO_3} (W_{Cc}^{FeMg} - W_{Cc}^{MgFe} + W_{Cc}^{CaMg} - W_{Cc}^{MgCa}) + (X_{Cc}^{FeCO_3} - X_{Cc}^{CaCO_3}) (W_{Cc}^{FeCa} - W_{Cc}^{CaFe}) - (1 - 2X_{Cc}^{MgCO_3}) C_{Cc} \}$$

$$- ((X_{Dol}^{FeCO_3})^2 (W_{Dol}^{MgFe} + 2X_{Dol}^{MgCO_3} (W_{Dol}^{FeMg} - W_{Dol}^{MgFe}))) + (X_{Dol}^{CaCO_3})^2 (W_{Dol}^{MgCa} + 2X_{Dol}^{MgCO_3} (W_{Dol}^{CaMg} - W_{Dol}^{MgCa}))) + (X_{Dol}^{FeCO_3}, X_{Dol}^{CaCO_3}) \{ (W_{Dol}^{FeMg} + W_{Dol}^{MgFe} + W_{Dol}^{CaMg} + W_{Dol}^{MgCa} - W_{Dol}^{FeCa} - W_{Dol}^{CaFe}) \} / 2 + X_{Dol}^{MgCO_3} (W_{Dol}^{FeMg} - W_{Dol}^{MgFe} + W_{Dol}^{CaMg} - W_{Dol}^{MgCa}) + (X_{Dol}^{FeCO_3} - X_{Dol}^{CaCO_3}) (W_{Dol}^{FeCa} - W_{Dol}^{CaFe}) - (1 - 2X_{Dol}^{MgCO_3}) C_{Dol} \}$$



(20)

Zach Sharp PhD 1987

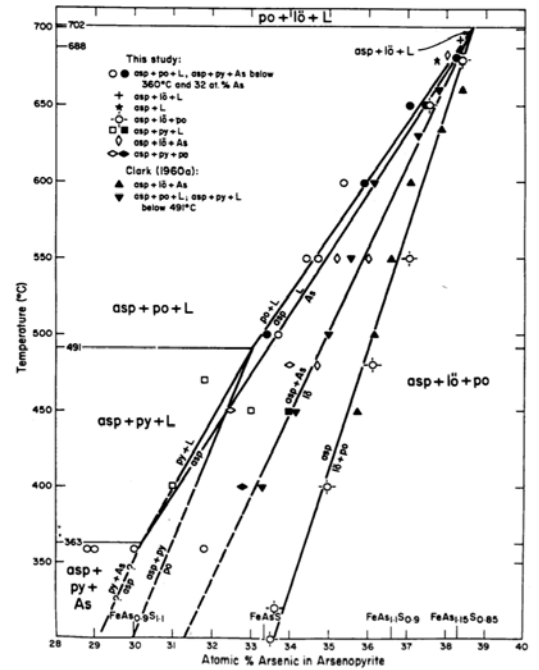
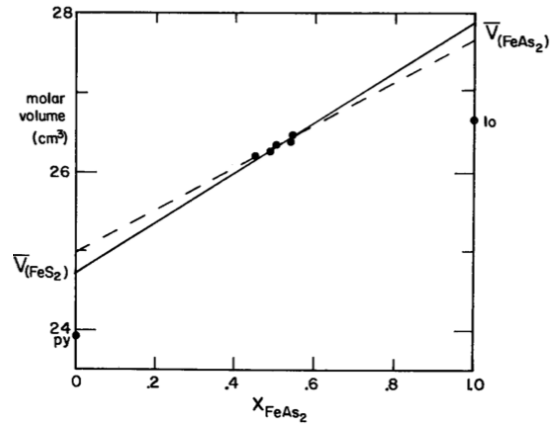
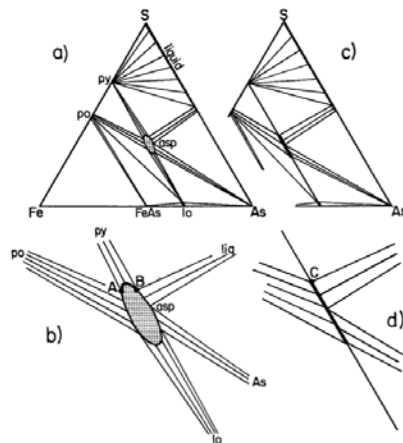
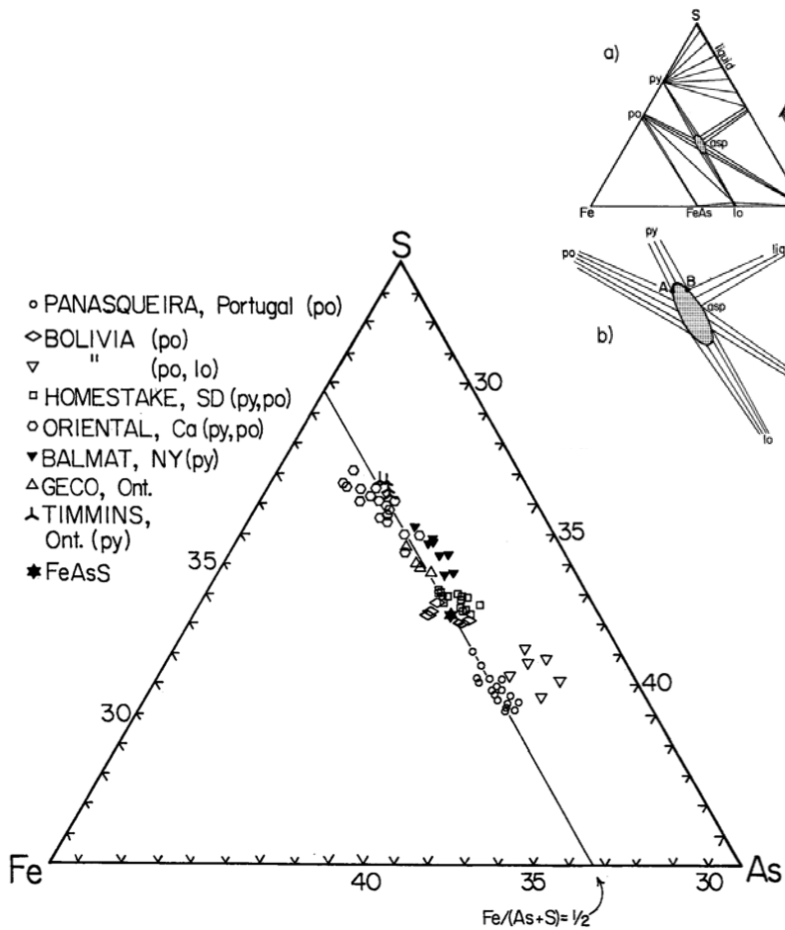
Canadian Mineralogist
Vol. 23, pp. 517-534 (1985)

Sharp, Essene & Kelly 1985

**A RE-EXAMINATION OF THE ARSENOPYRITE GEOTHERMOMETER:
PRESSURE CONSIDERATIONS AND APPLICATIONS TO NATURAL ASSEMBLAGES***

ZACHARY D. SHARP, ERIC J. ESSENE AND WILLIAM C. KELLY

Department of Geological Sciences, The University of Michigan, Ann Arbor, Michigan 48109, U.S.A.



Dave Moecher PhD 1988

Contrib Mineral Petrol (1988) 100:92-106

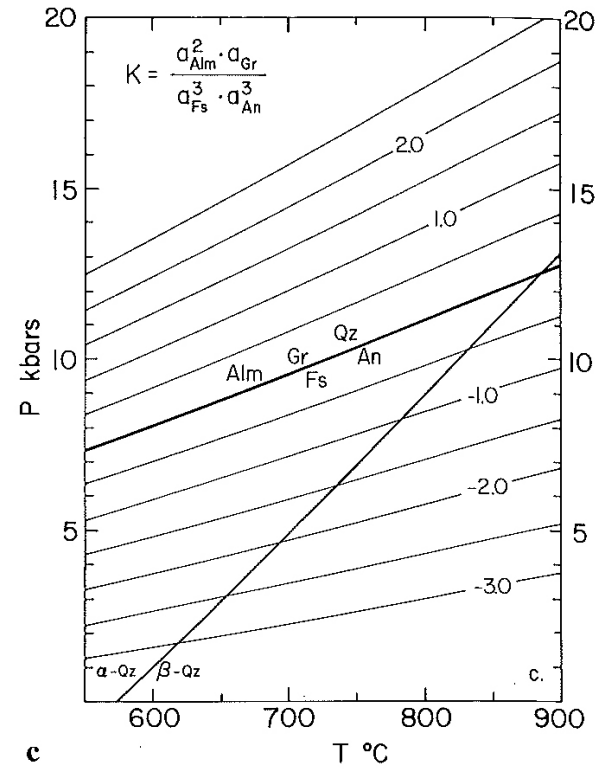
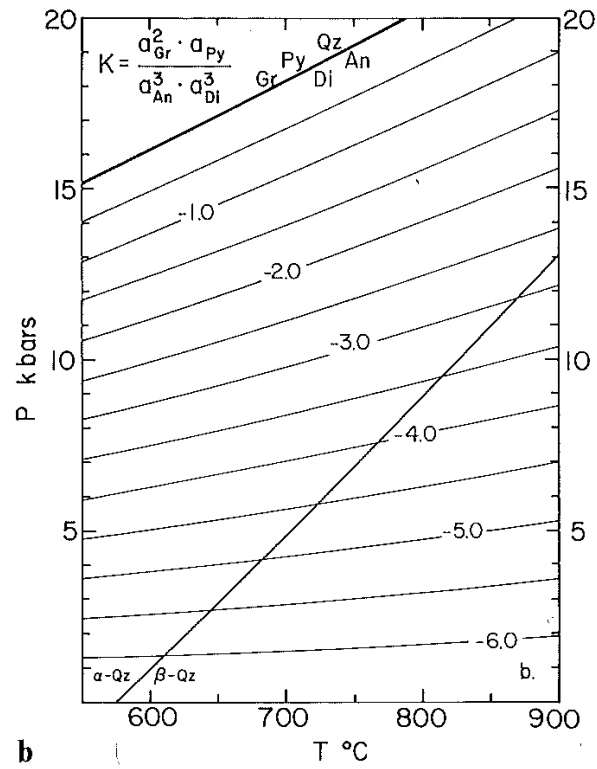
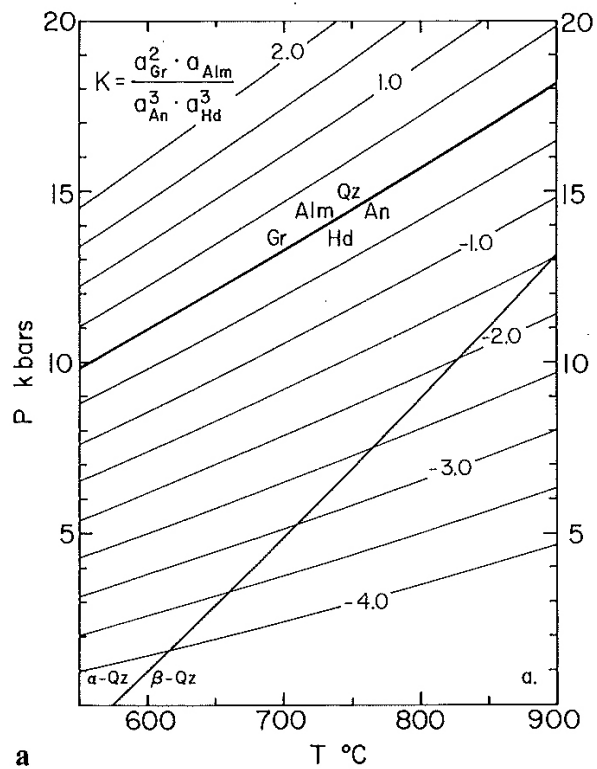
Contributions to
Mineralogy and
Petrology
© Springer-Verlag 1988

Moecher, Essene & Anovitz 1988

Calculation and application of clinopyroxene-garnet-plagioclase-quartz geobarometers*

D.P. Moecher, E.J. Essene, and L.M. Anovitz**

Department of Geological Sciences, University of Michigan, Ann Arbor, MI 48109-1063, USA

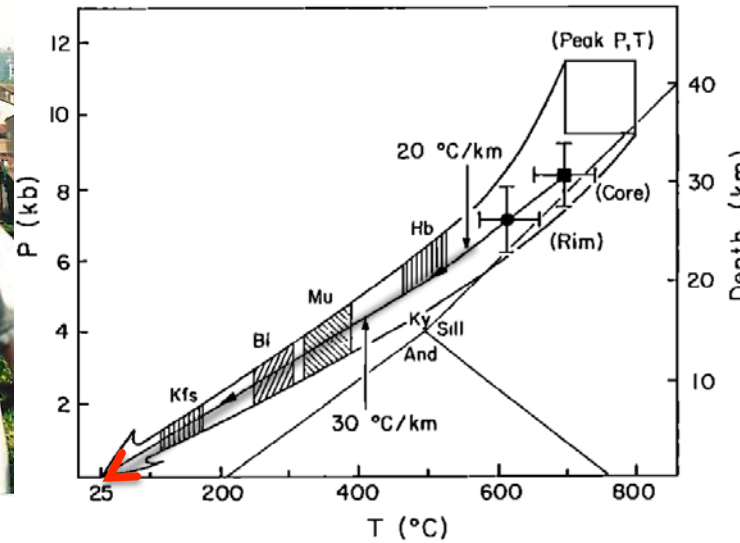
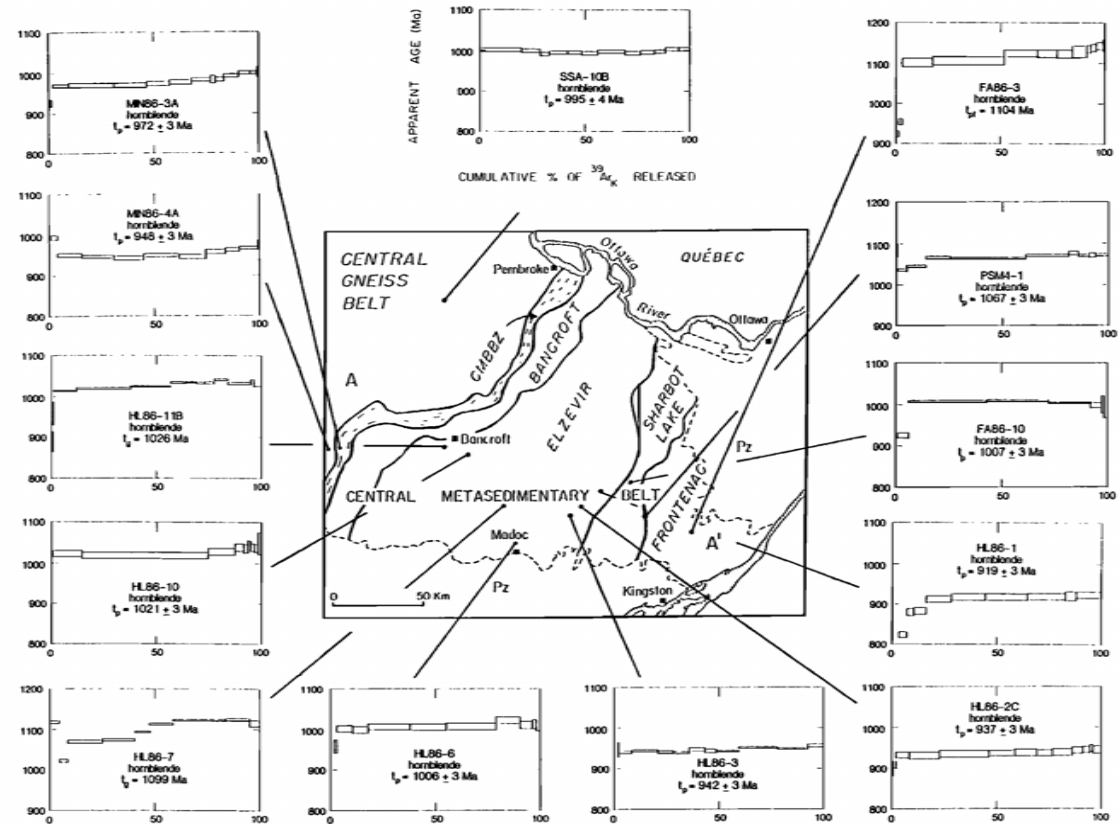


Mike Cosca PhD 1989

TECTONICS, VOL. 10, NO. 5, PAGES 959-977, OCTOBER 1991

COOLING AND INFERRED UPLIFT/EROSION HISTORY OF THE GRENVILLE OROGEN, ONTARIO: CONSTRAINTS FROM $^{40}\text{Ar}/^{39}\text{Ar}$ THERMOCHRONOLOGY

Cosca, Sutter & Essene 1991



MS Students

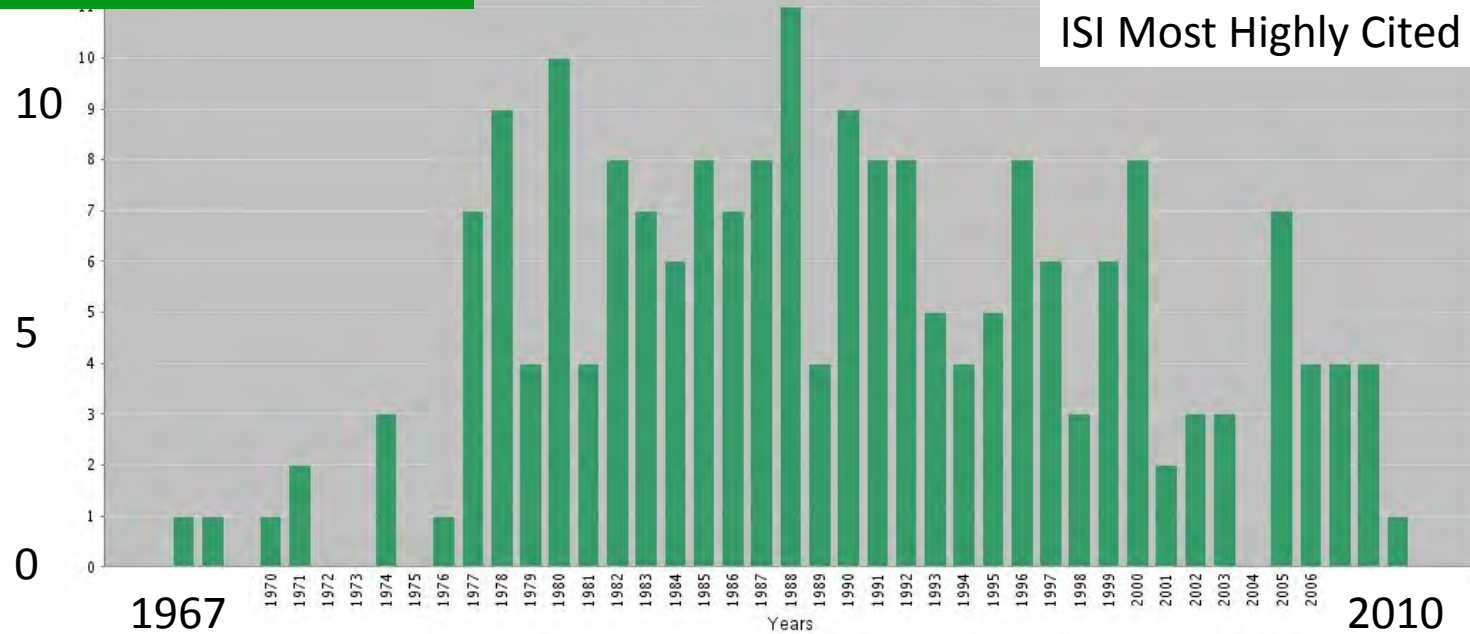
Yong, Wenjun	2005	Marcotty, Louise	1983
Page, Zeb	2001	Anovitz, Larry	1982
Clafin, Cliff	2001	Hoffman, Karen	1982
Dong, Weidong	2000	Fong, Lia	1981
Donohue, Casey	2000	Isaacs, Drew	1981
Streepey, Meg	1999	Johnson, Craig	1981
Stenger, David	1998	Duque, Pablo	1977
Borrok, David	1997	Winter, Gary	1977
Keane, Steve	1997	Valley, John	1977
Wang, Liping	1997	Bohlen, Steve	1976
Cureton, Jim	1994	Brown, Phil	1976
Dixon, Eleanor	1994	DeWitt, Dave	1976
Rathmell, Mark	1992	Grummon, Mark	1976
Tuccillo, M-E	1990	Nesbitt, Bruce	1976
Hayob, Jodie	1989	Perkins, Dex	1976
Edwards, Larry	1986	Kulvanich, Sam	1975
Cosca, Mike	1985	Metzger, Fred	1975
Herman, John	1985	Shedlock, Bob	1975
Richardson, S	1984	van den Berg, A	1975
Sharp, Zach	1984	Sobol, Joe	1973

PhD Students

Yong, Wenjun	2008	Kersting, Annie	1991
Manon, Matt	2007	Shau, Yen-Hong	1991
Page, Zeb	2005	Afifi, Aboud	1990
Core, Dan	2004	Cosca, Mike	1989
Tohver, Eric	2003	Moecher, Dave	1988
Donohue, Casey	2002	Anovitz, Larry	1987
Streepey, Meg	2001	Sharp, Zach	1987
Van Hees, Ed	2000	Ahn, Jung-Ho	1986
Wang, Liping	1999	Yau, Lancy	1986
Simon, Grigore	1998	Livnat, Alex	1983
Tropper, Peter	1998	Petersen, Erich	1983
Zhao, Donggao	1998	Treiman, Allan	1982
Li, Gejing	1997	Perkins, Dex	1981
Boundy, Teri	1995	Brown, Phil	1980
DeWolf, Charlie	1993	Nesbitt, Bruce	1980
Hayob, Jodie	1993	Valley, John	1980
Jiang, Wei-The	1992	Bohlen, Steve	1979
		Bowman, John	1977

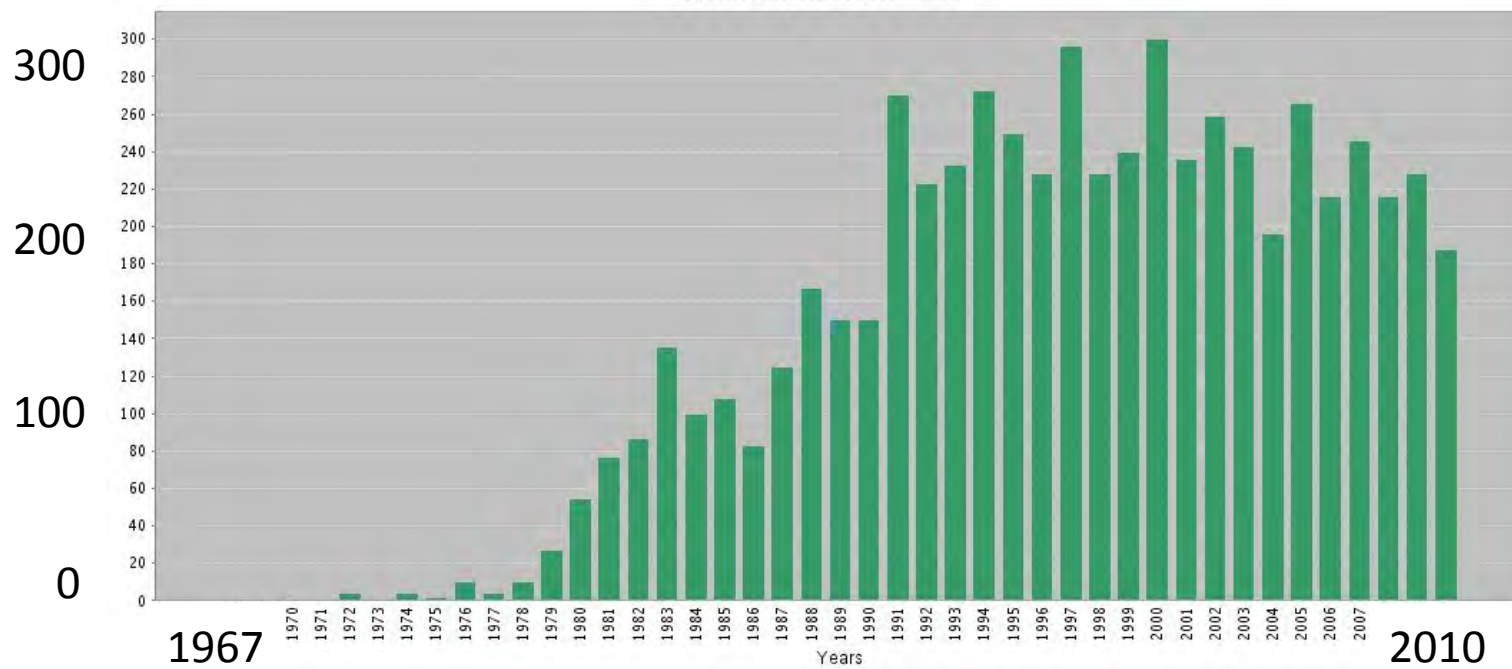
Published Items in Each Year

Eric Essene
ISI Most Highly Cited Researcher



N>190

Citations in Each Year



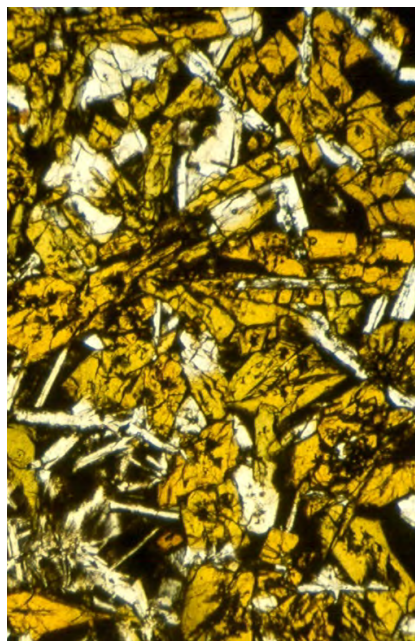
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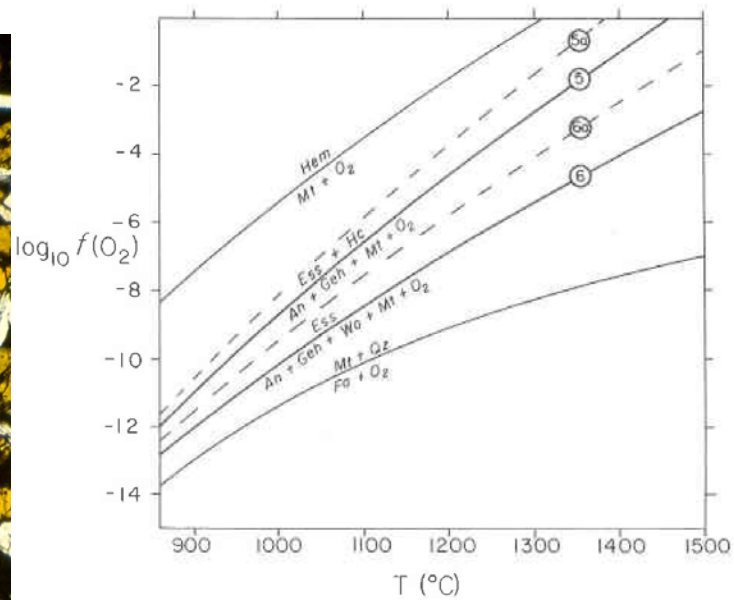
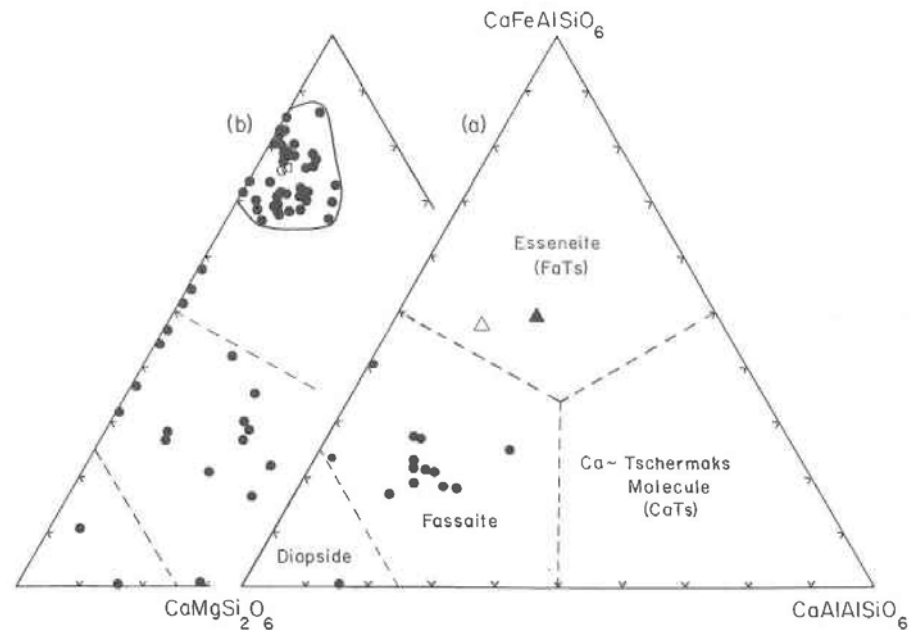
Chemistry and structure of esseneite ($\text{CaFe}^{3+}\text{AlSiO}_6$), a new pyroxene produced by pyrometamorphism*

MICHAEL A. COSCA, DONALD R. PEACOR

Department of Geological Sciences, University of Michigan, Ann Arbor, Michigan 48109, U.S.A.



Esseneite $\text{CaFe}^{3+}\text{AlSiO}_6$















Eric J. Essene 2010 Penrose Medal

“I’ve had a great ride in learning from those who taught me how to think in terms of projects that would otherwise have not been explored.

I am forever grateful for that opportunity. “

Cheers,

To all of my graduate students, and thanks for all the fish.

Eric J. Essene

May 2010