Fermat's Enigma Resolved: An Algebraic Proof of His Last Theorem

Roger Gilmont, Dorrance Publishing Co., Inc., 824 pp., $9.00, July 2005, ISBN: 0-80596-734-6

In the 17th century, a French judicial assistant and amateur mathematician, Pierre De Fermat, produced many brilliant ideas in the field of number theory. The Greeks were aware of many whole number solutions to the Pythagorean theorem, where the sum of two perfect squares is a perfect square. Fermat stated that no whole number solutions exist if higher powers replace the squares in this equation. In other words: you cannot find three numbers such that $x^n + y^n = z^n$, where n is greater than 2. Fermat scribbled in the margin of a book that he had found a "truly marvelous" proof, but he never considered the work important enough to publish.

Mathematicians sought this mathematical Holy Grail for over 300 years, many doubtful that it even existed. English-born Princeton professor Andrew Wiles finally proved what came to be known as "Fermat's Last Theorem" in 1994, using modern-day mathematics. But, an enigma remained: Did Fermat really construct a proof using 17th-century mathematics — and was it correct?

Dr. Roger Gilmont, a retired Brooklyn Polytechnic Institute professor of thermodynamics constructed his own proof and has offered a clear and decisive explication of it in, "Fermat's Enigma Resolved: An Algebraic Proof of His Last Theorem." This proof, which Gilmont maintains "students with reasonably good algebra skills can understand," vindicates Fermat by demonstrating that, whatever Fermat's proof may have been, it could have been done using the mathematics of his time. It's a compelling read for anyone with an appetite for algebraic challenges. And, it's suitable for educational purposes.

Reviewed by senior editor Rita D'Aquino

Industrial Catalysis: A Practical Approach

Jens Hagen, John Wiley & Sons, Inc., 525 pp., $190.00, March 2006, ISBN: 3-527-31144-0

Despite the fact that more than 90% of production processes in industry are catalyzed, most chemists and engineers are restricted to trial and error when searching for the proper catalyst. This book emphasizes the industrial aspects of catalysis. It is dedicated to both, homogeneous and heterogeneous catalysis and in this second edition, biocatalysis, electrocatalysis, photocatalysis and asymmetric catalysis are also included; topics like zeolites, metals and olefin catalysis are also discussed in more detail. The book helps practically oriented readers in becoming familiar with the processes of catalyst development and testing and therefore, deals with aspects of test planning, optimization, and reactor modeling and simulation with the easy-to-learn PC program POLYMATH. Well over 100 exercises help to test and consolidate the gained knowledge.

Identification of Cleaner Production Improvement Opportunities

Kenneth L. Mulholland, AIChE and John Wiley & Sons, Inc., 200 pp., $59.95, February 2006, ISBN: 0-471-79440-6
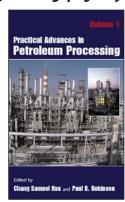
This book is a practical how-to manual for implementing the best pollution prevention strategies that are economical and efficient for eliminating costly end-of-pipe treatments. The author, Dr. Kenneth L. Mulholland, focuses on eliminating pollution at the source in order to achieve zero pollution and waste, thus lowering treatment costs. The strategies introduced in the book are based on actual case studies and promise to reduce waste generation by 40–50% with corresponding cost savings. The thrust of Mulholland's method is, "Instead of starting from the front of the process, start with the waste streams and move backward through the process and ask different questions of the same process information. Then, your views change completely." This offers a fresh perspective in identifying and evaluating alternative cleaner production strategies.

Practical Advances in Petroleum Processing

Chang S. Hsu and Paul R. Robinson, Editors, Springer, 910 pp., $210.00, September 2005, ISBN: 0-387-25811-9

Want to know how to make ULSD? Formulate a lube base stock? Clean up an oil spill? Optimize an entire refinery? From oil production to product blending, "Practical Advances in Petroleum Processing" provides general overviews and in-depth reference material on these topics and scores of others. Even if you don't find what you need in this book, most likely it will lead you to the answer you need; the book's 50 contributors from eight different countries in North America, Europe and Asia have provided hundreds of useful references. They represent oil companies, universities, catalyst vendors, process licensors, consultants and engineering contractors. The breadth of this two-volume book is unique. It covers areas seldom found in other works on petroleum processing. These include refinery economics, model-predictive control, process modeling, online optimization, safety and environmental protection.