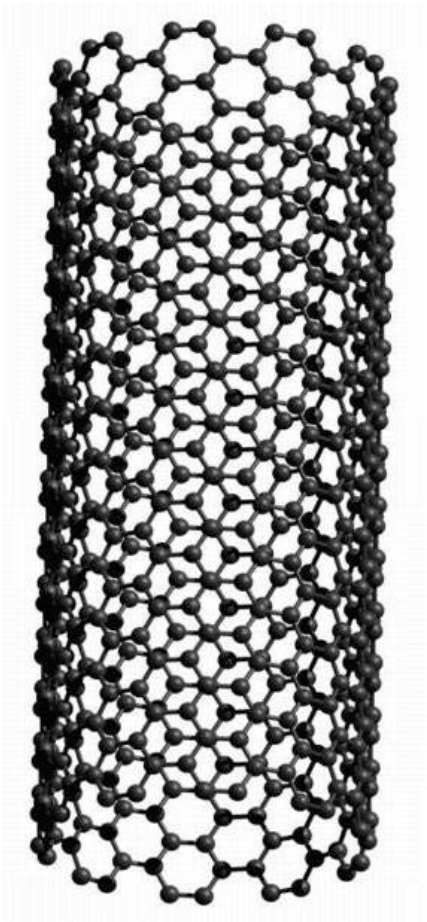
"California's History of Environmental, Health, and Safety Policies for Nanotechnology."

By Sergio Cardenas
Chemistry Major
College of the Canyons

CNS Mentor: Roger Eardley-Pryor
Adviser: Professor Patrick McCray
UCSB Department of History



CNS-UCSB

Center for Nanotechnology in Society

Why Study Nanotechnology in Society?

Public Perceptions

Shapes Policy

Potential for Commercialization

Funding for Science Research

Environmental Health And Safety (EHS)

Societal Impacts on

- Workers
- Consumers
- Environment

California Environmental Protection Agency

CalEPA

California Department of Toxic Substances Control

DTSC

Research Methods: Historical Analysis

Historians tell a Story with sources and evidence

Primary Source

Assembly Bill No. 289

CHAPTER 699

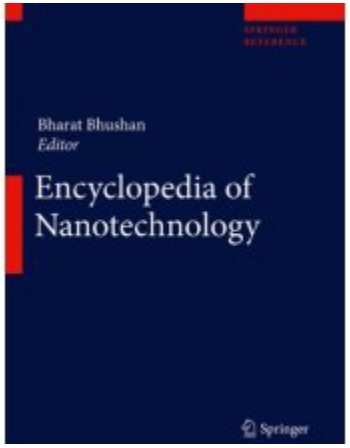
An act to add Sections 57018, 57019, and 57020 to the Health and Safety Code, relating to hazardous chemicals.

[Approved by Governor September 29, 2006. Filed with Secretary of State September 29, 2006.]

LEGISLATIVE COUNSEL'S DIGEST

Policies: CA Assembly Bill No. 289
Newspaper Articles
Scientific Studies

Secondary Source



Encyclopedias
Textbooks
Publications

Historical Analysis argues How and Why events occur.
It draws meaning from those events in a narrative framework

Research Goals

Examine the History of CA Nano-Regulation

Answer these questions

- Why did California take steps to regulate nanotechnology?
  - Balancing Safety and Economic Growth
- How California approached Regulation
  - Assembly Bill 289
- Why did California Choose Carbon Nanotubes first?

    Novelty and Toxicity

http://www.123rf.com/photo_7698100_3d-made--flag-map-og-california.html

Provide a model for Future Regulation to States & Nations

Why did California take steps to regulate nanotechnology?

- Impacts of Nano are unknown
- CA most populous state in US
  - Exposure to Nano
- CA vows to protect environment
  - Water Systems
- Currently unregulated industry

- CA: top ten economies in world
- CA Leader of Technology
  - Silicon Valley
- Blue Ribbon Task Force
  - Clear goals for competition
- CA most populous state in US
  - Jobs are essential to CA
- ~$1 Trillion industry by 2015

California has a lot at stake on both ends of the spectrum

How California approached Regulation?

California Passed
Assembly Bill No. 289
On September 29, 2006

→ Allows Cal EPA Request's Data on Nano Specific Chemicals

↓ January 22, 2009 Mandatory Information Request for Carbon Nanotubes

Why did California Choose Carbon Nanotubes first?

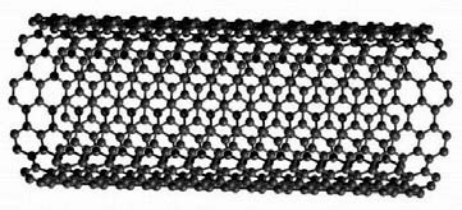
Novelty of Carbon Nanotubes

1985 Discovery of "Buckminsterfullerene" Richard Smalley and Colleagues

www.chemheritage.org

Only 20 Years of Research is available for Carbon Nanotubes

1991 Discovery of "Carbon Nanotubes" Sumio Iijima and Colleagues



"Bucky balls" and CNT's only exist at the Nanoscale
Other Nano chemicals have macro scale equivalents

Why did California Choose Carbon Nanotubes first?

Toxicity of Carbon Nanotubes

California highlights two studies for choosing Carbon Nanotubes

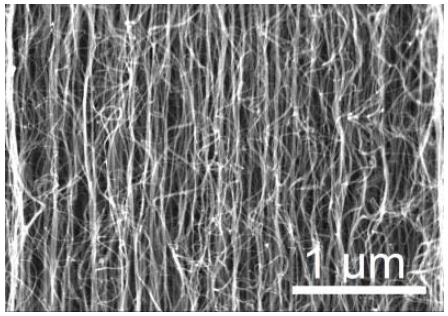
2007/ 2008 studies indicate carbon nanotube

- manufacturing process by products could harm workers
- Carbon Nanotubes could end up in drinking water

Avoiding Asbestos

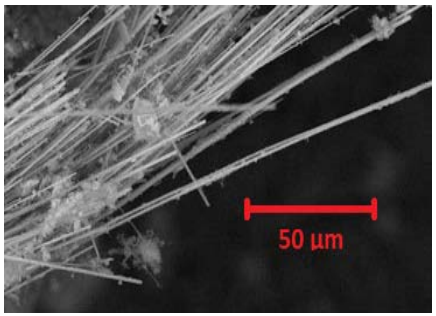
The bulk studies between 2002-today note similarities between Carbon Nanotubes and Asbestos

Carbon Nanotubes



www.eurekalert.org

Asbestos



www.ecfia.eu

Toxicity
Piercing Cells
Mesothelioma
Tumors

Mainly a concern for workers

Why did Cal DTSC ignore Asbestos/CNT relationship?

Public Perception

Historical Example

Genetically Modified Food Backlash

The NewLeaf Potato

Carbon Nanotubes already seen Negative Press

Los Angeles Times

May 21st 2008 “Cancer risk seen in nanotechnology; Tiny cylinders used in some products act like asbestos, a study finds.”

Conclusion

Why did California take steps to regulate nanotechnology?

- Balancing Safety and Economic Growth

How California approached Regulation

- Assembly Bill 289

Why did California Choose Carbon Nanotubes first?

Novelty and Toxicity

Future Research

Was the Information Call in Successful?

How will California use information collected?

Compare California with the Federal Government.

Thank You

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Questions?