



Chemistry and Society: Peer-Review as Teaching and Evaluation Devices within a Multitude of Subjects

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Chemistry and food

Chemistry and medicine

Chemistry and energy

Chemistry in the boudoir

Forensic chemistry

Other technological and utility subjects

Chemistry explaining the world

Local and very specific subjects

General and historical subjects

Chemistry and war

Astronomy and spacial subjects

Weeks 1-2: Choosing the subject, learn how to find information, about journals, editors and authors, and how to write and revise an article

Weeks 3-8: Five minutes presentations (pitch) of the subjects plus ten minutes discussion

Weeks 9-12: Writing the revision articles based on the presentation and discussion

Week 13: Engage in the anonymous peer-review process

Week 14: Receive the anonymous revision of the written article

Week 15: Correct the article after the revision and responding to the reviewers through the “editor”

1 NO POVERTY



4 QUALITY EDUCATION



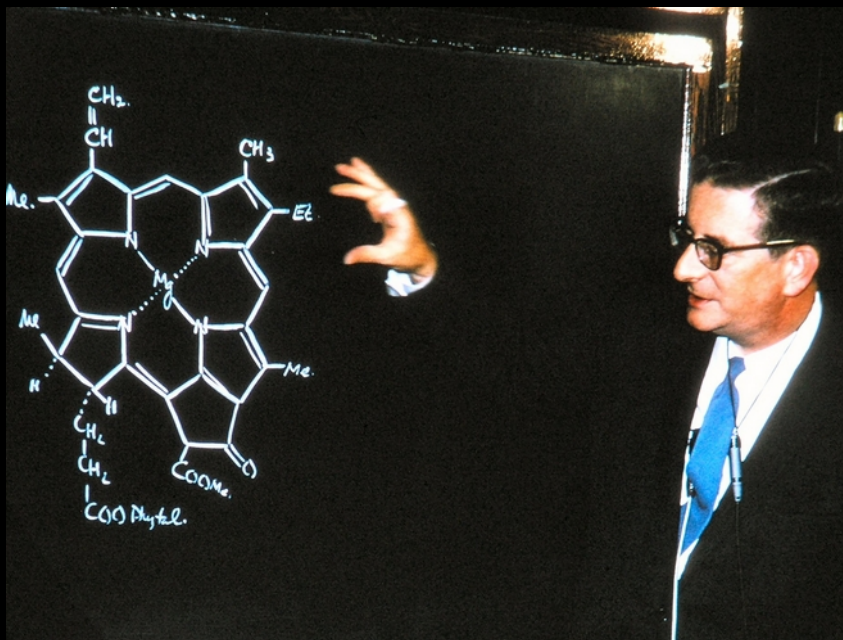
5 GENDER EQUALITY



8 DECENT WORK AND ECONOMIC GROWTH



10 REDUCED INEQUALITIES



Robert B. Woodward (1917 – 1979)
Nobel 1965



Gertrude Elion (1918 – 1999)
Nobel, 1988

But if the two countries or governments are at war, the men of science are not. Humphry Davy remark when receiving a medal from Napoleon in 1807

Polanyi (1962). *The republic of science. Its political and economic theory.*

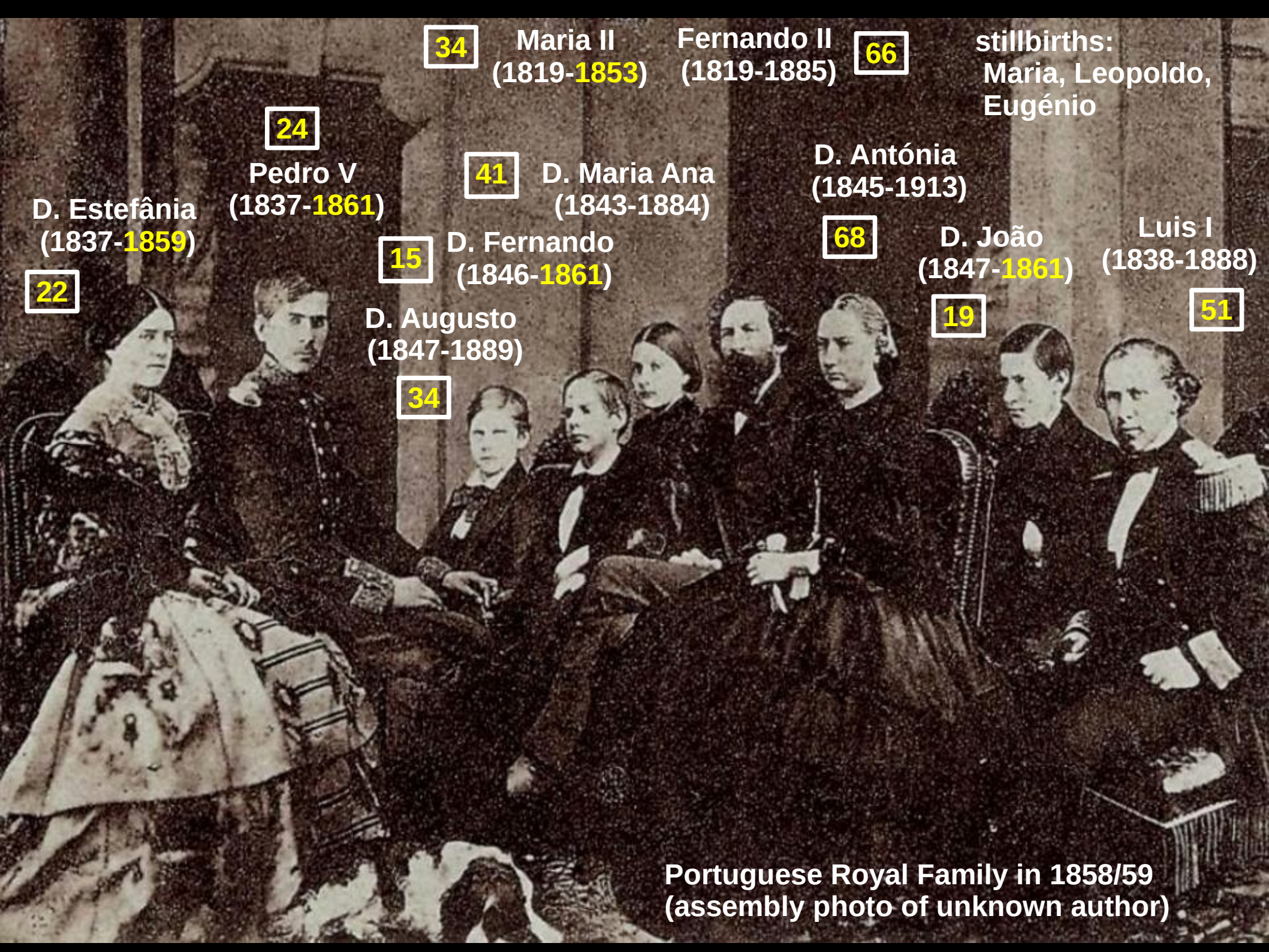
16 PEACE AND JUSTICE
STRONG INSTITUTIONS



17 PARTNERSHIPS
FOR THE GOALS



Rodrigues (2019). What can Chemists and the Public Learn from Biographies of Chemists? in *Perspectives on Chemical Biography in the 21st Century*, Ed. Malaquias & Morris, Cambridge Scholars, pp.172-179.



34 Maria II
(1819-**1853**)

Fernando II
(1819-1885)

66

stillbirths:
Maria, Leopoldo,
Eugénio

24

Pedro V
(1837-**1861**)

41

D. Maria Ana
(1843-1884)

D. Antónia
(1845-1913)

D. Estefânia
(1837-**1859**)

15

D. Fernando
(1846-**1861**)

68

D. João
(1847-**1861**)

Luis I
(1838-1888)

22

D. Augusto
(1847-1889)

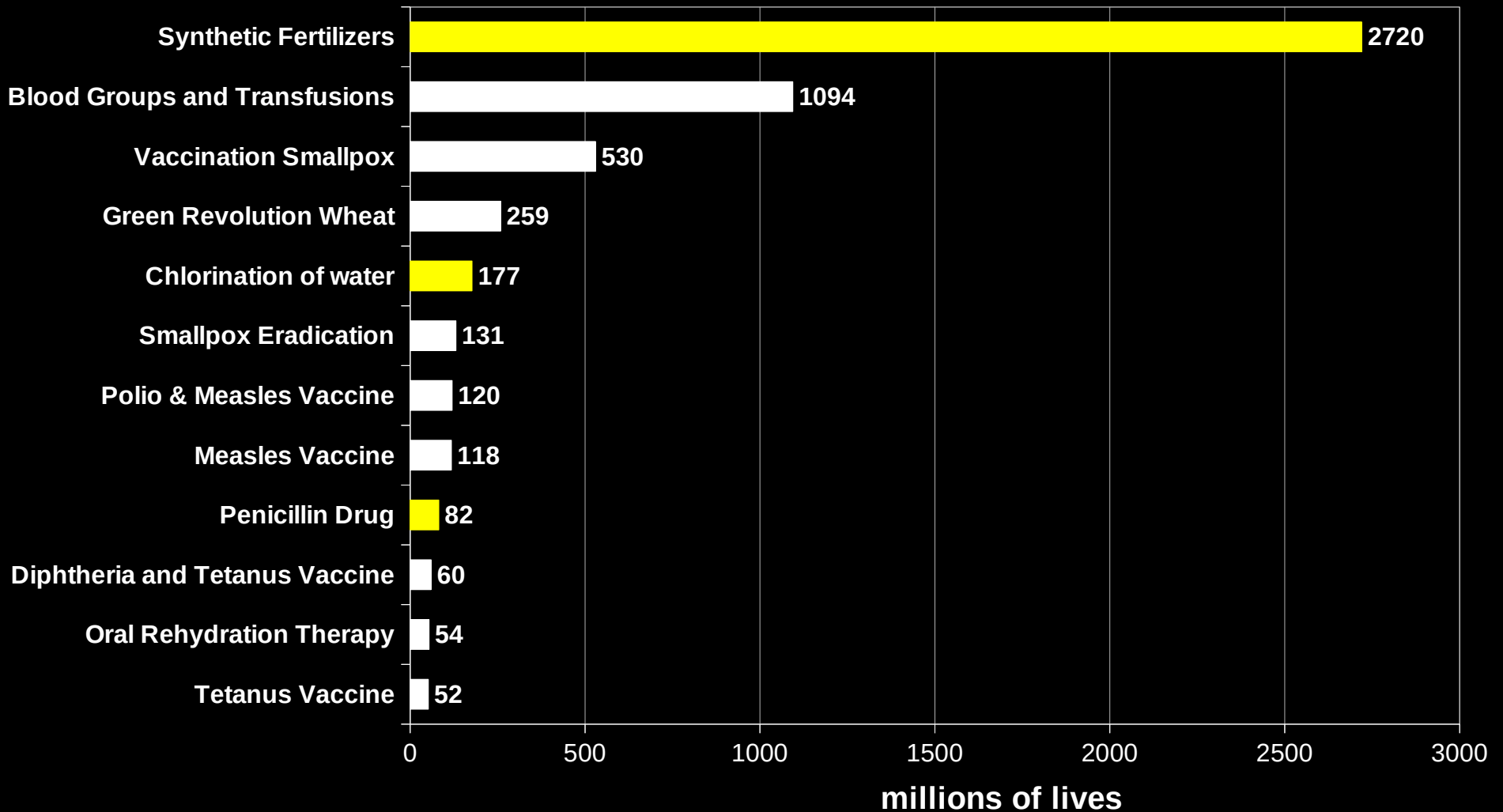
19

51

34

Portuguese Royal Family in 1858/59
(assembly photo of unknown author)

How many lives have been saved due to scientific discoveries?



(estimates form site *Science Heroes*, <http://www.scienceheroes.com/>)

DU PONT
(1802-2018)

Nestlé
(1866-)
41
48

Shell
(1907-)
21
11

CHEMCHINA
中国化工集团公司
China National Chemical Corporation
(1984-)

syngenta
(2000-2018)

P&G
(1837-)
71
51

DOW
(1897-2018)

MONSANTO
(1901-2018)
(427)

Pfizer
(1849-)
49
44

UNION CARBIDE
(1917-2001)

BAYER
(1863-)
102
100

BAYER
(1863-)

ExxonMobil
(1999-)
13
13

BASF
(1865-)
107
82

I.G. Farben
(1925-1951)

BASF
(1865-)
We create chemistry

NOVARTIS
(1996-)
68
63

covestro
400

Forbes (2018, 2020)

1800

1850

1900

1950

2000

Perkin mauveine synthesis (1857)

World War I (1914-1918)

World War II (1939-1944)

FDA (1906, 1938, 1959-)

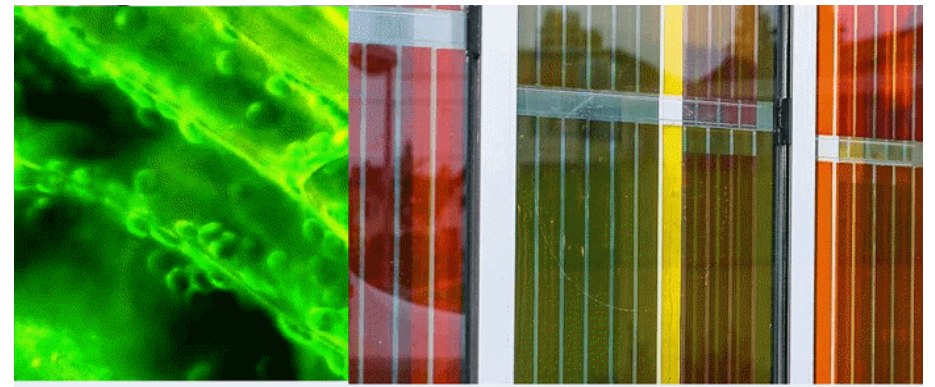
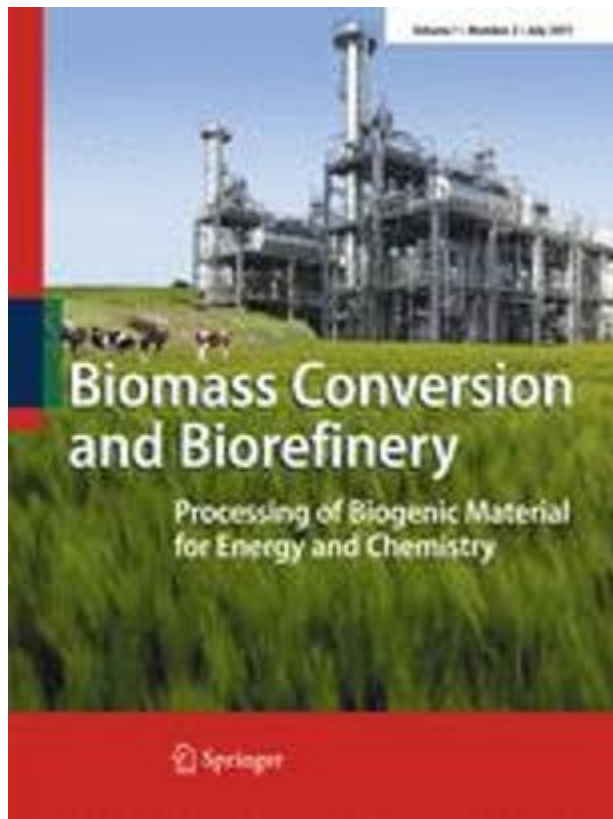
IUPAC (1919-)

Vietnam War (1955-1975)

Silent Spring (1962)

Thalidomide tragedy (1957-1963)

Bhopal disaster (1984)



new solar cells and solar harvesting



new material for harsh environments



new batteries and supercapacitors

Chemistry saves the whales and the elephants!

Dead whale With more than 40 kg plastic!



**More than three thousand million
people saved by chemistry**

**By 2050, plastic in the
oceans will outweigh fish**

More than 177 million of substances organic and inorganic

Training Contact Us News About CAS

100,000,000

CAS REGISTRY has reached 100 million chemical substances

CAS Registry Numbers provide unique identifiers to access the exact chemical needed for research, safety and compliance.

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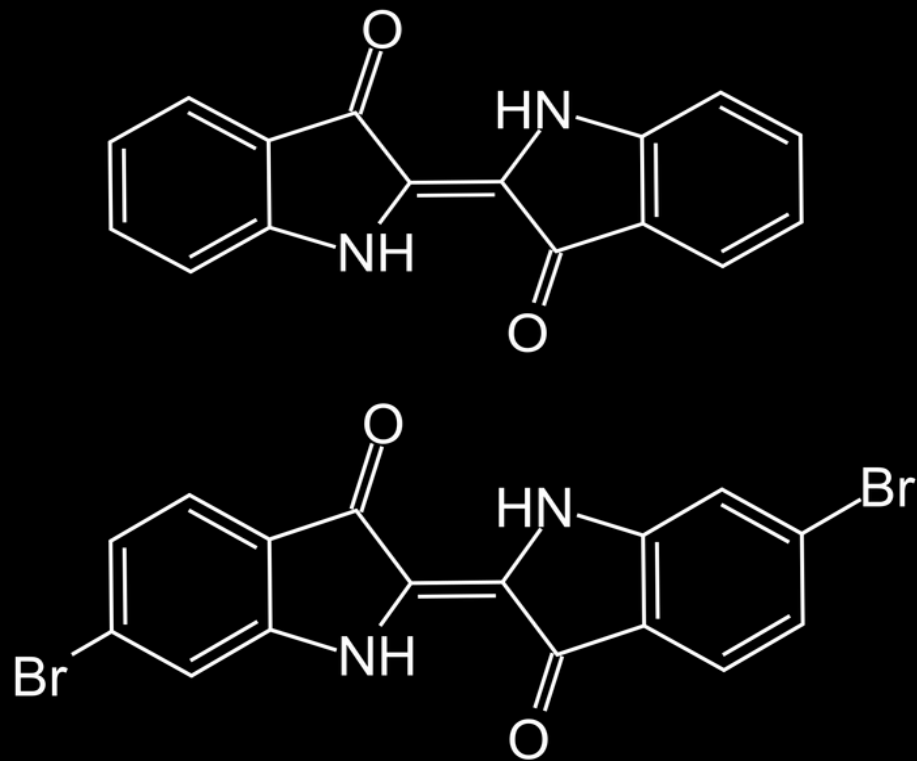
Patent Experts

No one else has more...

102,033,560 ORGANIC AND INORGANIC SUBSTANCES TO DATE

A global team of scientists is continually adding

Indigo and Tyrian purple





new materials for oil spillage



more sustainable fish farming

marine drugs IMPACT FACTOR 3-345

Current Status of Marine-Derived Compounds as Warheads in Anti-Tumor Drug Candidates

MDPI mdpi.com/journal/marinedrugs
ISSN 1660-3397

Volume 13 Issue 4
April 2017



PLASTIC OCEAN

192 COUNTRIES BORDERING THE ATLANTIC, PACIFIC, INDIAN OCEANS AND MEDITERRANEAN AND BLACK SEAS PRODUCED **2.5 BILLION METRIC TONS OF SOLID WASTE IN 2010**. AN ESTIMATED **8 MILLION METRIC TONS** OF PLASTIC ENTERED THE OCEAN THAT SAME YEAR.

Ocean Conservancy

2.5 BILLION METRIC TONS OF SOLID WASTE IS PRODUCED ALL AROUND THE WORLD

2 BILLION PEOPLE WITHIN 30 MILES OF THE COAST CREATE **100M** METRIC TONS OF COASTAL PLASTIC WASTE

AND EVERY YEAR, **8 MILLION** METRIC TONS OF PLASTIC GOES INTO THE OCEAN

AND WITHIN THAT **275M** METRIC TONS IS PLASTIC WASTE

WHAT WE CAN DO

- REDUCE PLASTIC IN WASTE STREAM
- IMPROVE SOLID WASTE MANAGEMENT
- INCREASE CAPTURE & REUSE

HEALTHY OCEANS

JAMBECK ET AL., SCIENCE 2015
*PLASTICS EUROPE, "PLASTICS—THE FACTS 2011" (2010 DATA)
**COZZAR ET AL., 2014; ERIKSEN ET AL., 2014

12 RESPONSIBLE
CONSUMPTION
AND PRODUCTION



Department of Chemistry, University of Coimbra
Chemistry and Medicinal Chemistry, 1st, 2nd, and 3rd cycle
Forensic Chemistry, 2nd cycle



FCT
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