

Salvador Dalí "The Chemist"

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## THE PROPOSAL OF A CHARTER OF THE ETHICAL PRINCIPLES OF CHEMICAL SCIENCES BY THE ITALIAN CHEMICAL SOCIETY

It must be recognised that extraordinary benefits derive by a correct use of the chemical science in several fields of technology. About 40,000,000 different substances have been classified CAS (Chemical Abstract Service), about 100,000 substances have been commercialised until today, while, 30,000 substances are produced in amounts greater than 1 t/year. The advantages of a so large availability of new substances are: improved quality and duration of life; availability of more food, clothes and goods, at low price for everybody; improved health and hygienic conditions; improved possibilities of communication. Unfortunately, also some drawbacks arised such as: pollution, environmental deterioration, new diseases, accidents and disasters originated by the use of dangerous substances. A development without drawbacks is strongly required today in the more developed countries. This can be achieved with a global effort of all the human powers pursuing a sustainable development of the chemical technology in a way schematized in Fig. 1.

Political power, mainly interested to the people consensus, make this through the promulgation of new and more restrictive laws (see for example Reach approved by the European Parliament). Economical power, mainly interested to the profit but limiting as much as possible the risks, promoted the "Responsible Care Program" to which many Companies adhere. At last, although Universities and no-profit cultural Association often mentioned the necessity of a new "sustainable" approach to chemistry this aspect is, normally, poorly treated at the educational level and the cultural suasion of the mentioned Institutions is still weak. Probably, this is due to the absence of a Code of Con-

duct for Chemists universally accepted promoted by a well reputed International Association after a wide discussion on the ethical problems connected with the use and misuse of chemistry.

Ethics is strictly bonded to the human good behaviour in a particular ambit and has an evaluation parameter that is "responsibility". Unfortunately, responsibility is an ambiguous concept. We can distinguish, first of all, among "individual responsibility" and "responsibility of aggregated systems" (an association, a company, a public institution etc.). We can recognize, then, a "retrospective responsibility" (perfectly definable as a consequence of a determinate occurred action) and a "responsibility in prospect" corresponding to a prognosis more or less doubtful on the possible consequences of a projected action. Retrospective responsibility is a matter of law. Responsibility in prospect is the subject of ethics. As, in the same ambit, different types of responsibilities exist, these can give place to a "Conflict of responsibility". For example, each person has responsibilities toward himself, the family, the colleagues of work, the company in which he works, the town in which he lives, the nation and the humanity.

The conflict of responsibility is often solved with the abrogation of some responsibilities for a more general interest. The easier understandable examples are: the war in which to kill the enemies is not considered unethical, the study and development of chemical weapons. However, unethical behaviours in chemistry can derive also from:

- (i) not clear conception of ethics, responsibilities and related conflicts.
- (ii) low professional pride of Chemists and their poor awareness about the importance of Chemistry for the Society considering that this Sci-

ence has changed more deeply than others the life on the Planet;  
 (iii) ignorance, negligence and hostile attitude;  
 (iv) improper use of chemistry.

The acknowledgment of a profession is based on a Social Pact in which the Human Society recognize to a Profession the privilege of the monopoly on a certain field of competence if the professional man accepts to dedicate his knowledge to the public good. This Social Pact is recognized, for example, also by the Law for Physicians, Lawyers and Architects, while, is not fully recognized until now for Chemists and Chemical Engineers.

However, with respect to the other mentioned professions, the Profession of Chemists and/or Chemical Engineers is much more articulated and maybe too young for obtaining a general social confidence.

To gain more social confidence it is very important that Chemists learn to communicate with the Society explaining in a way understandable to all:

- in what consist their profession
- what are the advantages of this profession for the common good
- what are the ethical constraints that they want to respect in order to protect the society from an improper use of chemistry
- what are the disciplinary measures they want to adopt on a professional basis to punish not ethical behaviour.

In order to reach the mentioned objectives it could be also useful:

- i) to define and subscribe a universally shared Charter of Ethical Principles for the Chemical Science that would be preliminar to a more detailed Code of Behaviour (this could be different for different nations, companies and association)
- ii) to introduce ethical principles and ethical code in the Education of the new generation of students.

At this purpose, the Italian Chemical Society (SCI) has developed and approved "A Charter of the Ethical Principles of Chemical Sciences". This Charter can be downloaded from the web site:

[www.soc.chim.it/it/search/node/Charter](http://www.soc.chim.it/it/search/node/Charter).

The Charter is organized in the following different chapters:

- Preamble
- Ethical principles
- Conceptual dualism
- Propositions
- Connections to awareness of the Chemical Sciences and to Professional Education
- Areas of greatest Risk for improper use of Chemistry
- Defense
- Areas of charter application
- Declarations
- The cultural commitment of the experts of chemistry and chemical technology
- The solemn promise of the chemist and the chemical engineers in receiving a degree or diploma.

The most relevant aspects reported in those chapter will be summarized here. In the Preamble, for example, is reported that the aims of the Chemical Sciences can be only two:

- 1) protect the earth, and the biosphere and its ecosystems
- 2) improve the quality of life, reducing to a minimum or eliminating

entirely potential negative effects on the environment.

In the chapter of ethical principles is reported that it is essential to train researchers and technicians to identify the correct path in a conceptual duality between what is *proper* and what is *improper* in chemistry in such a way that, at the point at which their work commences, they first ask themselves these questions:

- 1) does it improve the quality of life?
- 2) does it damage the earth and its ecosystems?

In the chapter "Areas of greatest Risk for improper use of Chemistry" the following list of risk areas is reported:

- Chemical weapons, "dual chemistry," and the production of chemical intermediates,
- Herbicides, pesticides, and insecticides whose effects on the environment remain unchecked, even following excessive use,
- Production commerce and use of drugs,
- Urban, industrial, and hospital wastes,
- Use of harmful and toxic substances in manufacturing cycles,
- The deliberate or accidental release of harmful substances into the environment,
- Production and use of new, insufficiently tested chemical products (this aspect is now regulated by European Project: REACH - Regulation, Evaluation, Authorization of Chemicals).

At last, the Charter, after a detailed description of the ethical principles that would be respected by all the chemists in their professional activities is concluded by the solemn promise (Fig. 2) that would be subscribed by Chemists and Chemical Engineers in receiving a degree or diploma.

This Charter together with other similar initiatives taken in other countries could be considered as a base for developing an International agreement on a shared Universal Charter of the Ethical Principles of the Chemical Sciences.

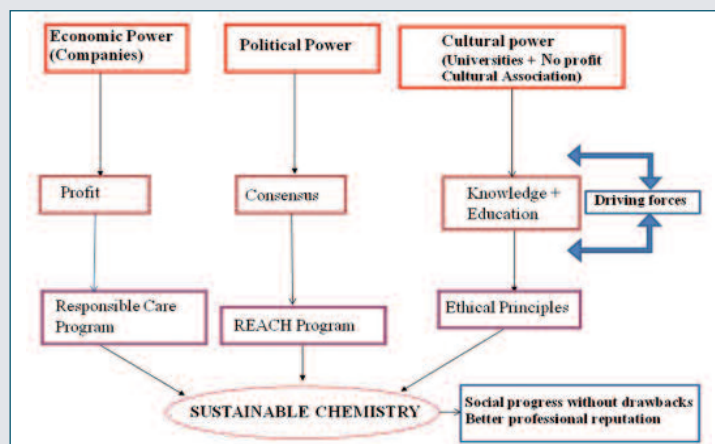


Fig. 1 - The driving forces pushing toward a "Sustainable Chemistry"

**I SOLEMNLY PROMISE:  
 TO APPLY THE ETHICAL OBJECTIVES OF THE CHEMICAL SCIENCES, WHICH  
 ENTAIL:**

- OPPOSITION TO THE IMPROPER USE OF CHEMISTRY,
- SAFEGUARDING OF THE ENVIRONMENT AND ITS ECOSYSTEMS,
- IMPROVING THE QUALITY OF LIFE WITHOUT HARMING THE WORLD AROUND US,
- DISSEMINATION OF AWARENESS OF THE ADVANTAGES AND BENEFITS OF THE CHEMICAL SCIENCES IN PUBLIC OPINION.

Fig. 2 - The Chemists and Chemical Engineers solemn promise