

# **IUPAC Gold Book: Recent Technical Advancements**



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*Scope*: The International Union of Pure and Applied Chemistry (IUPAC) Compendium of Chemical Terminology (the "Gold Book") compiles definitions of terms and concepts relevant to chemistry that have been published in IUPAC Recommendations. The Gold Book should be relevant to all users of its content, irrespective of their geographical location or level of chemical education, thus supporting the IUPAC mission of providing a common language for chemistry.

# **Project Overview**

The IUPAC Gold Book is an important resource for the Union and currently there are many activities designed to expand and improve the content. The website was renovated in 2019 and since then an update project has been initiated to update the current terms and expand them with additional terms from IUPAC Recommendations in Pure and Applied Chemistry (PAC). The intent to add all IUPAC defined terms that are current and in scope for the Gold Book. The site will then be the online source of concept definitions in chemistry sourced from PAC Recommendations.

# IUPAC Gold Book Roadmap

- 2019 Renovation of the Gold Book Website
- 2020 Initiation of the Gold Book Update Project
- 2021 Development of the online Gold Book Term Review System (TRS)
- 2023 New (2021 onwards) PAC Recommendation

Joint Subcommittee of the IUPAC Gold Book

Co-Chairs • Stuart Chalk • Jan Kaiser Members

definitions added to the Gold Book

- 2024 Revised metadata model for Gold Book definitions
- 2025 By the IUPAC GA all approved PAC Recommendation terms added and available (included historical revisions)
- 2025 onwards Additional term gap analysis

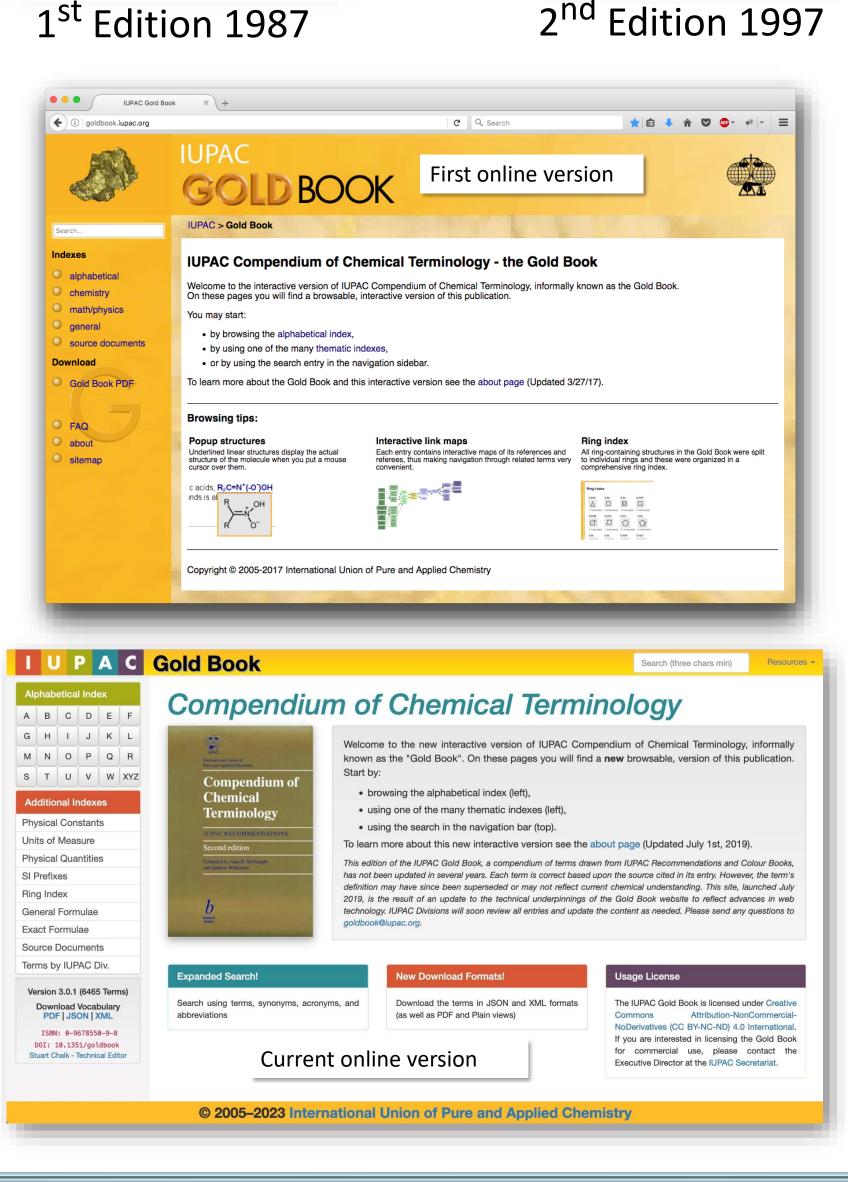
• Jeremy Frey

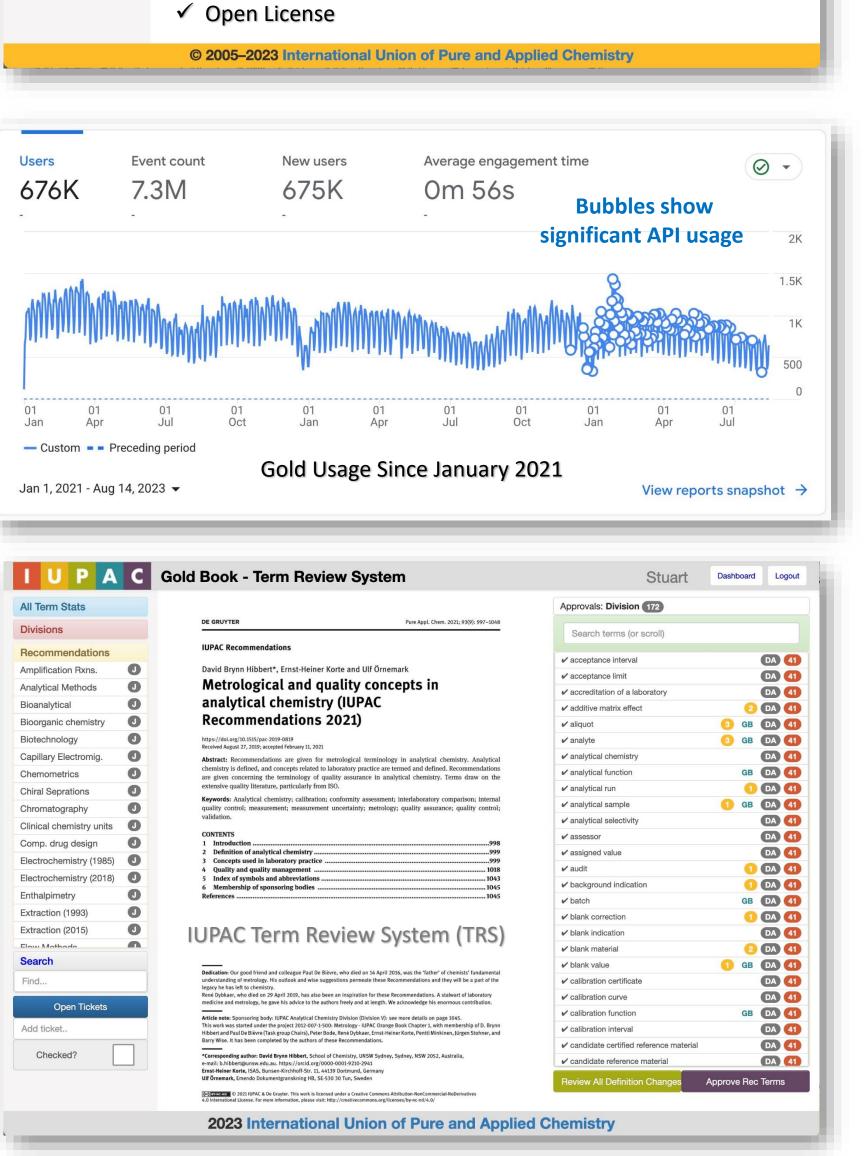
- Clara Magalhães
- Doug Templeton
- Leah McEwen

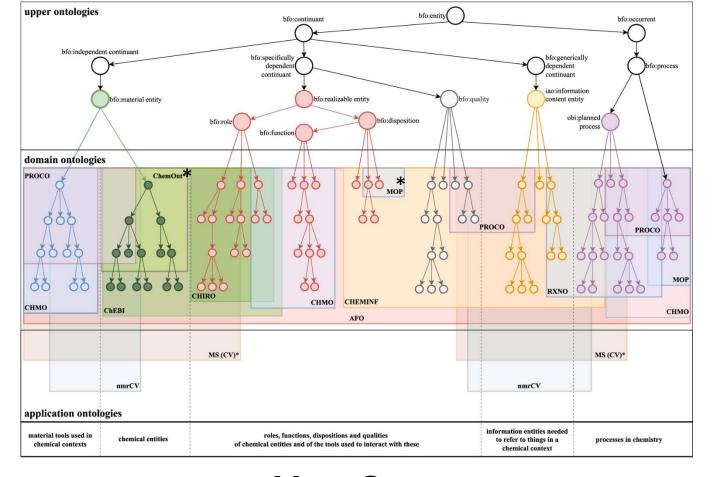
Jurgen Stohner

Fabienne Meyers

Editions **Digital Applications & Use Cases Current Status** Application I U P A C Gold Book Search (three chars min) -Alphabetical Index Gold Book definitions are used in ontologies to provide semantic meaning for machines . absorbance, A Online use... -A B C D E F (\*ontology using Gold Book definitions) Graphics courtesy of NFDI4Chem Manual straight of the state of G H I J K L Pass and Applied Champs https://doi.org/10.1351/goldbook.A0002 M N O P Q R Compendium of Logarithm of the ratio of incident to transmitted radiant power through a sample (excluding the S T U V W XYZ effects on cell walls). Depending on the base of the logarithm a decadic and Napierian Chemical Solvent-Free Diels-Alder Reaction in a Closed Batch System Additional Indexes absorbance are used. Symbols: A,  $A_{10}$ ,  $A_e$ . This quantity is sometimes called extinction, Daolai Sun, Fumiya Sato, Yasuhiro Yamada, Satoshi Sato **Physical Constants** although the term extinction, better called attenuance, is reserved for the quantity which takes Terminology Jnits of Measure nto account the effects of luminescence and scattering as well. **Physical Quantities** SI Prefixes **Experimental Description** Green Book, 2<sup>nd</sup> ed., p. 32 [Terms] [Book] IUPAC RECOMMENDATIONS **Ring Index** \* AFP:0002833 General Formulae PAC, 1990, 62, 2167. (Glossary of atmospheric chemistry terms (Recommendations 1990)) on process) Exact Formulae page 2169 [Terms] [Paper] englishity Alien D. McNarig Source Documents PAC, 1996, 68, 2223. (Glossary of terms used in photochemistry (IUPAC Recommendations of Antice, Wideman Terms by IUPAC Div. 1996)) on page 2226 [Terms] [Paper] Version 3.0.1 (6465 Term Cite as: IUPAC. Compendium of Chemical Terminology, 2nd ed. (the "Gold Book"). Compiled by A. D. McNaught and A. Wilkin Download Vocabulary PDF | JSON | XML 3lackwell Scientific Publications, Oxford (1997). Online version (2019-) created by S. J. Chalk. ISBN 0-9678550-9-8. https://doi.ou ISBN: 0-9678550-9-8 DOI: 10.1351/goldbook tuart Chalk - Technical Edito Div. ] PDF Text JSON History Quantity Last revised: October 7, 2008 --- ---✓ 6465 Current Terms each with Digital Object Identifier (DOI) InChI=1S/C8H8O3/c9-7-5-3-1-2-✓ Application Programming Interface (API) CHEMINF:000113 (InChi descr







#### **Use Case** Gold Book definitions in Wikipedia Pages

→ C O	A https://en.wikipedia.org/wiki/Absorption_(chemistry)			۲	¢	ப	-
	Absorption (chemistry)		文 <sub>A</sub> 44 languages ∽				
Contents [hide]	Article Talk		Read Edit View history Tools ~				
(Top) Equation	From Wikipedia, the free encyclopedia						
✓ Types of absorption	Not to be confused with Adsorption.						
Chemical absorption Physical absorption Water in a solid	In chemistry, <b>absorption</b> is a physical or chemical phenomenon or a process in which atoms, molecules or ions enter some bulk phase – liquid or solid material. This is a different process from adsorption, since molecules undergoing absorption are taken up by the volume, not by the surface (as in the case for adsorption).		H <sub>2</sub> O <u>1b</u>				
Moisture regain See also References	A more common definition is that "Absorption is a chemical or ph atoms and ions of the substance getting absorbed enter into the material in which it is taken up."						
	A more general term is <i>sorption</i> , which covers absorption, adsorption, and ion exchange. Absorption is a condition in which something takes in another substance. <sup>[1]</sup>		<b>E</b>				
	In many processes important in technology, the chemical absorp e.g., absorption of carbon dioxide by sodium hydroxide – such a partition law (see: solubility).						
	For some examples of this effect, see liquid-liquid extraction. It is phase to another without a chemical reaction. Examples of such tetroxide. <sup>[1]</sup>	H <sub>2</sub> O +CO <sub>2</sub>					
	The process of absorption means that a substance captures and transforms energy. The absorbent distributes the material it captures throughout whole and adsorbent only distributes it through the surface.		Laboratory absorber. 1a): CO <sub>2</sub> inlet; 1b): <sup>[]</sup> H <sub>2</sub> O inlet; 2): outlet 3): absorption column; 4): packing.				
	The process of gas or liquid which penetrate into the body of ads	sorbent is commonly known as absorption.					
	Equation [edit]	I U P A C Recommended	Term 🖸 🖸 💿				
	If absorption is a physical process not accompanied by any other physical or chemical process, it usually follows the Nernst distribution law:		in a liquid, attachment of molecules of a gas,				
	"the ratio of concentrations of some solute species in two bulk phases when it is equilibrium and in contact is constant for a given solute and bulk phases":	<ul> <li>vapour, liquid, or dissolved substance to a solid surface by physical forces, etc. In spectrophotometry, absorption of light at characteristic wavelengths or bands of wavelengths is used to identify the chemical nature of molecules, atoms or ions and to measure the concentrations of these species.</li> <li>2. A phenomenon in which <u>radiation</u> transfers to matter which it traverses some of or all its energy.</li> </ul>					
	$rac{[x]_1}{[x]_2} =  ext{constant} = K_{N(x,12)}$						
	The value of constant $K_N$ depends on temperature and is called partition coefficient. This equation is valid if	chemistry terms (Recommendations 1990)) on					
	concentrations are not too large and if the species "x" does	36 Official IUPAC Definition					
	not change its form in any of the two phases "1" or "2". If such molecule undergoes association or dissociation then	<u>م</u>				:	

### **Future Outlook**

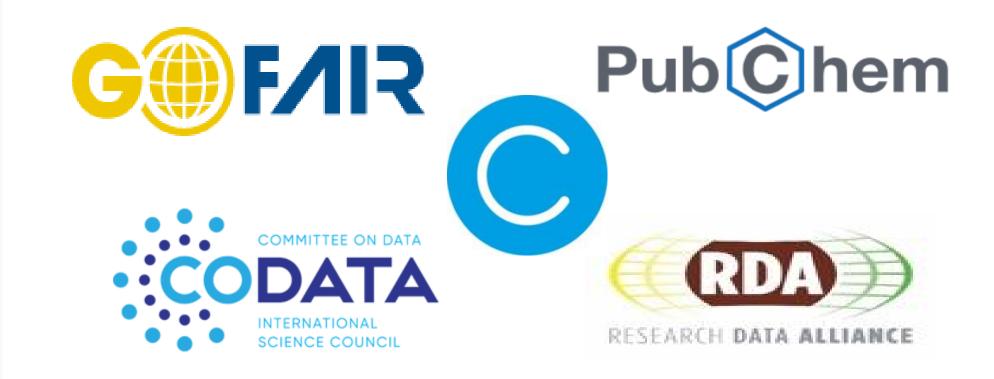
- Complete update based on the existing terms defined in all IUPAC Recommendations
- Update/expand DOI metadata
- Identify addition chemistry concepts that do not have a formal IUPAC definition (gap analysis)
- Promote use of Gold Book terms in disciplinary and cross-disciplinary ontologies
- Repurpose definitions in the Gold Book to develop IUPAC metadata schema and data models

### Partners & Acknowledgments

**PSDI** 







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