

Federation of Clinical Chemistry and Laboratory Medicine) in collaboration with IUPAC (International Union of Pure and Applied Chemistry).

Numerous diseases are associated with alterations in peripheral blood lymphocyte subpopulations, and the need to communicate the different cell types and differentiation states is therefore of outmost importance for clinical decisions in diagnosis, prognosis, and patient monitoring. Hematopoietic stem cells (HSCs) are multipotent, self-renewing progenitor cells from which all differentiated blood cell types arise during the process of hematopoiesis. These cells include lymphocytes, granulocytes, and macrophages of the immune system, as well as circulating erythrocytes and platelets. The lymphocytes, with the two distinct classes of B- and T-cells, constitutes the core of the adaptive immune system. And the differentiation of T-cells into effector and memory subsets represents a fundamental role in our ability to fight viruses or tumors, and our capacity to expand rapidly upon a secondary stimulation.

This document describes how the Nomenclature for Properties and Units (NPU) terminology can be applied to differentiate between cell subpopulations of the hematopoietic lineage. The clusters of differentiation molecules are included in the NPU syntax, together with its correct affiliations to indicate their presence or absence. This allows for identification and isolation of cell populations, subsets, and differentiation stages, which is essential for correct diagnosis and treatment of several malignancies and autoimmune diseases.

<https://iupac.org/project/2021-022-1-700/>

Definition of materials chemistry (IUPAC Recommendations 2024)

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Materials chemistry is focused on the design, preparation, and understanding of innovative materials. It is an emerging area of research where definitions are not well established. This document defines the area of materials chemistry for the benefit of chemistry communities and the general public worldwide interested in this discipline. This recommendation defines the term

“materials chemistry” as the “scientific discipline that designs, synthesizes, and characterizes materials, with particular interest on processing and understanding of useful or potentially useful properties displayed by the materials designed and synthesized for specific applications.”

<https://iupac.org/project/2020-022-1-200/>

IUPAC Recommendations: (Un)equivocal Understanding of Hydrogen and Halogen Bonds and Their (Un)equivocal Naming!

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This manuscript shows that Si-H hydrogen acts as a donor of electron density to halogen atoms in $\text{Me}_3\text{Si-H}\cdots\text{Y}$ complexes ($\text{Y} = \text{CF}_3\text{I}$, BrCN), thus proving that, consistent with IUPAC definitions of hydrogen and halogen bonds, hydridic hydrogen functions as a halogen bond acceptor. This has been necessitated by a paper recently published asking whether the definition of hydrogen bonding should be revised to include hydridic H atoms acting as electron donors. The authors discuss the various nomenclatures used for referring to intermolecular/noncovalent bonds formed by various elements and point out the convention established in naming them by IUPAC, after long deliberations among the chemists from all over the world.

IUPAC has so far approved the definitions of hydrogen bond (<https://doi.org/10.1351/PAC-REC-10-01-02>), halogen bond (Group 17; <https://doi.org/10.1351/PAC-REC-12-05-10>), chalcogen bond (Group 16; <https://doi.org/10.1515/pac-2018-0713>), and pnictogen bond (Group 15; <https://doi.org/10.1515/pac-2020-1002>). As one can see, except for hydrogen bond, other names indicate a group of elements. Any proposed new name underwent a very rigorous process with multiple rounds of peer-review and involved the whole chemistry community being open for public comment before acceptance.

<https://iupac.org/project/2016-001-2-300/> and former projects referred therein.