The ongoing challenge of novel psychoactive drugs of abuse. Part I. Synthetic cannabinoids (IUPAC Technical Report)

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In the past decade, the world has experienced a large increase in the number of novel compounds appearing on the illicit drug market for recreational purposes. Such substances are designed to circumvent governmental regulations; the illegal drug manufacturers take a known psychoactive compound reported in the scientific literature and slightly modify its chemical structure in order to produce analogues that will mimic the pharmacological activity of the original substance. Many of these novel substances are sold via the Internet. Among the various chemical classes, synthetic cannabinoid receptor modulators, commonly referred to as "synthetic cannabinoids," have been at the forefront, as demonstrated by the frequency of drug seizures, numerous severe toxic effects, and fatalities associated with some of these substances.

This review presents the chemical structures of relevant synthetic cannabinoids and describes their mechanism of action, pharmacological features, metabolic pathways, and structure-activity relationships. It illustrates the approaches used in forensic testing, both for bulk analysis (drug seizures) and for analytical toxicology (biological matrices) and discusses aspects of regulation surrounding this drug class. This report is intended to provide pertinent information for the purposes of informing scientific, medical, social, and governmental bodies about this ever-evolving recreational drug class and the challenges it poses worldwide.

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Nomenclature of flavonoids (IUPAC Recommendations 2017)

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Flavonoid structures, found in nature or obtained by synthesis, may be very complex. These Recommendations provide a guide for flavonoid aglycone names. This will also allow the construction of the names for their polyglycosylated species with clarity and conciseness. A joint working party of IUPAC and International Union of Biochemistry and Molecular Biology (IUBMB) members has prepared these recommendations, which establish rules for the general nomenclature of flavonoids, providing examples of acceptable trivial names, and names derived from trivial names, together with semi-systematic and fully systematic names that follow the published IUPAC recommendations.

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Standard reporting of Electrical Energy per Order (E_{EO}) for UV/H_2O_2 Reactors (IUPAC Technical Report)

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The concept of Electrical Energy per Order (EEO) was introduced in 2001 as a figure of merit for evaluating the energy requirements of ultraviolet-based advanced oxidation processes (UV AOPs) used for the degradation of various organic contaminants. The EEO parameter represents the energy input into the reactor that can achieve an order of magnitude decrease in the concentration of a target contaminant in a unit volume. Since the introduction of this parameter, it has become increasingly popular among UV AOP researchers and practitioners. However, the EEO is often reported without important details that affect the parameter, making its interpretation difficult. The EEO depends on a variety of factors (*e.g.* the concentration and identity of the target contaminant and the amount of hydrogen peroxide added). Therefore, the EEO parameter needs to be reported in the literature with several other experimental details affecting the reactor performance and in a way that proper comparisons can be made between reactors across studies or manufacturers. This paper discusses the proper application of the EEO parameter for bench-, pilot-, and full-scale studies. Sucralose (artificial sweetener, $C_{12}H_{19}C_{l3}O_8$) is proposed as a standard substance for reactor comparison.

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