

Atmosphere				
Usual North American Name Name in IEC 60079-20 (if different) (See Note 1)	CAS Reference Number	Minimum Ignition temperature °C	Gas Group North America	Gas Group IEC
ammonia	7664-41-7	630	D	IIA
benzene	71-43-2	560	D	IIA
benzine (see petroleum naphtha)				
benzol (see benzene)				
butane	106-97-8	372	D	IIA
1-butanol (butyl alcohol) butan-1-ol	71-36-3	359	D	IIA
2-butanol (secondary butyl alcohol) butan-2-ol	78-92-2	405 (Note 2)	D	IIA
butyl acetate	123-86-4	370	D	IIA
isobutyl acetate	110-19-0	421 (Note 2)	D	IIA
ethane	74-84-0	515	D	IIA
ethanol (ethyl alcohol)	64-17-5	363	D	IIA
ethyl acetate	141-78-6	460	D	IIA
ethylene dichloride 1,2-Dichloroethane	107-06-2	438	D	IIA
gasoline petroleum	86290-81-5	560	D	IIA
heptanes	142-82-5	215	D	IIA
hexanes	110-54-3	233	D	IIA
isoprene	78-79-5	395 (Note 2)	D	IIA
methane	74-82-8	537	D	IIA
methanol (methyl alcohol)	67-56-1	386	D	IIA
3-methyl-1-butanol (isoamyl alcohol)	123-51-3	350 (Note 2)	D	IIA
methyl ethyl ketone butanone	78-93-3	404	D	IIA
methyl isobutyl ketone 4-methylpentan-2-one	108-10-1	475	D	IIA
2-methyl-1-propanol (isobutyl alcohol)	78-83-1	415 (Note 2)	D	IIA
2-methyl-2-propanol (tertiary butyl alcohol)	75-65-0	478 (Note 2)	D	IIA
naphtha (see petroleum naphtha)				

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Usual North American Name	Name in IEC 60079-20 (if different) (See Note 1)				
natural gas			482 (Note 2)		
petroleum naphtha	naphtha	64742-95-6	290	D	IIA
octanes	octane	111-65-9	206	D	IIA
pentanes	pentanes (mixed isomers)	109-66-0	258	D	IIA
1-pentanol (amyl alcohol)	pentan-1-ol	71-41-0	298	D	IIA
propane		74-98-6	470	D	IIA
1-propanol (propyl alcohol)	propan-1-ol	71-23-8	405	D	IIA
2-propanol (isopropyl alcohol)	propan-2-ol	67-63-0	425	D	IIA
propylene	propene	115-07-1	455	D	IIA
styrene		100-42-5	490	D	IIA
toluene		108-88-3	535	D	IIA
vinyl acetate		108-05-4	425	D	IIA
vinyl chloride	chloroethylene	75-01-4	415	D	IIA
xylene		106-42-3	464	D	IIA

Notes

- (1) Most of the values in this table have been obtained from IEC Standard 60079-20 "Electrical apparatus for explosive gas atmospheres - Part 20: Data for flammable gases and vapours, relating to the use of electrical apparatus" first edition (1996-10). In many cases, the name used in the IEC standard differs from the usual name used in North America for the same substance. In fact, chemicals may have several different names. The CAS number provided above is a well-known method of uniquely identifying chemicals and is a required feature of MSDS documentation.
- (2) Substance not listed in IEC 60079-20.
- (3) Name is incorrectly stated in IEC 60079-20 as "1,2-epoxypropene". Propylene oxide is also known as 1,2-epoxypropane.

Reasons for Request:

The above proposed changes put the CEC in line with the IEC gas groups as stated in IEC 60079-20 "Electrical Apparatus for Explosive Gas Atmospheres - Part 20 - Data for flammable gases and vapours, relating to the use of electrical apparatus, First Edition 1996-10." Most countries using the IEC standards for hazardous locations equipment also use IEC 60079-20 to find out which Group (IIA, IIB, or IIC) a gas belongs to, as well as the minimum ignition temperature (lowest temperature the substance will be ignited by a hot surface). The data in IEC 60079-20 is regularly reviewed but the data in our Code is not. A key reference, NFPA 325, on which the values in our Code were historically based, has been withdrawn by NFPA.

Supporting Information:

The above-named references. In addition, the chemical names were checked by two people (a chemical engineer and a chemist) at the Canadian Explosives Research Laboratory. I have compiled a table which compares the data in our Code, data in the last available NFPA 325, and IEC 60079-20. In the new proposed table, I have included the CAS reference since there are often variations in chemical names which this reference makes unambiguous.

For reference purposes, the following is a table that compares the values of existing Appendix B, NFPA 325 and IEC. This is for reference only, I am not proposing that the following be included in the code.

Atmosphere Usual North American Name Name in IEC 60079-20 (if different) (See Note 1)	CAS Reference Number	Minimum Ignition Temperature °C			Gas Group North America	Gas Group IEC
		Appx B	NFPA 325	IEC		
acetylene	74-86-2	305	305	305	A	IIC
butadiene buta-1,3-diene	106-99-0	420	420	430	B	IIB
hydrogen	1333-74-0	429	429	560	B	IIC
manufactured gases containing more than 30% hydrogen (by volume)		500	500	Note 2	B	
propylene oxide (Note 3)	75-56-9	499	449	430	B	IIB
acetaldehyde	75-07-0	175	175	204	C	IIA
cyclopropane	75-19-4	498	498	498	C	IIA
diethyl ether	60-29-7	160	180	160	C	IIB
ethylene	74-85-1	450	450	425	C	IIB
hydrogen sulphide	7783-06-4	260	260	270	C	IIB
unsymmetrical dimethyl hydrazine (UDMH 1,1-dimethyl hydrazine) N,N-Dimethylhydrazine	57-14-7	249	249	240	C	IIB
acetone	67-64-1	465	465	535	D	IIA
acrylonitrile	107-13-1	481	481	480	D	IIB
alcohol (see ethanol)					D	
ammonia	7664-41-7	651	651	630	D	IIA
benzene	71-43-2	498	498	560	D	IIA
benzine (see petroleum naphtha)						
benzol (see benzene)						
butane	106-97-8	287	287	372	D	IIA
1-butanol (butyl alcohol) butan-1-ol	71-36-3	343	343	359	D	IIA
2-butanol (secondary butyl alcohol) butan-2-ol	78-92-2	405	405	Note 2	D	IIA
butyl acetate	123-86-4	425	425	370	D	IIA
isobutyl acetate	110-19-0	421	421	Note 2	D	IIA
ethane	74-84-0	472	472	515	D	IIA
ethanol (ethyl alcohol)	64-17-5	363	363	363	D	IIA
ethyl acetate	141-78-6	426	426	460	D	IIA
ethylene dichloride 1,2-Dichloroethane	107-06-2	413	413	438	D	IIA

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		Appx B	NFPA 325	IEC		
gasoline petroleum	86290-81-5	280	280	560	D	IIA
heptanes	142-82-5	204	204	215	D	IIA
hexanes	110-54-3	223	225	233	D	IIA
isoprene	78-79-5	395	395	Note 2	D	IIA
methane	74-82-8	537	537	537	D	IIA
methanol (methyl alcohol)	67-56-1	385	464	386	D	IIA
3-methyl-1-butanol (isoamyl alcohol)	123-51-3	350	350	Note 2	D	IIA
methyl ethyl ketone butanone	78-93-3	404	404	404	D	IIA
methyl isobutyl ketone 4-methylpentan-2-one	108-10-1	448	448	475	D	IIA
2-methyl-1-propanol (isobutyl alcohol)	78-83-1	415	415	Note 2	D	IIA
2-methyl-2-propanol (tertiary butyl alcohol)	75-65-0	478	478	Note 2	D	IIA
naphtha (see petroleum naphtha)						
natural gas		482	482	Note 2		
petroleum naphtha naphtha	64742-95-6	288	232	290	D	IIA
octanes octane	111-65-9	206	206	206	D	IIA
pentanes pentanes (mixed isomers)	109-66-0	260	260	258	D	IIA
1-pentanol (amyl alcohol) pentan-1-ol	71-41-0	300	300	298	D	IIA
propane	74-98-6	432	450	470	D	IIA
1-propanol (propyl alcohol) propan-1-ol	71-23-8	412	412	405	D	IIA
2-propanol (isopropyl alcohol) propan-2-ol	67-63-0	399	399	425	D	IIA
propylene propene	115-07-1	455	455	455	D	IIA
styrene	100-42-5	490	490	490	D	IIA
toluene	108-88-3	480	480	535	D	IIA
vinyl acetate	108-05-4	402	402	425	D	IIA
vinyl chloride chloroethylene	75-01-4	472	472	415	D	IIA
xylene	106-42-3	463	463	464	D	IIA

Chair's Comments: I concur.

Subcommittee Deliberation: There were eleven replies, all in favor without comment.

Subcommittee Recommendation: Accept the proposal. The following sentence is added to note 1 to assist readers of the code in further understanding of the use of the CAS number:
“Further information on the CAS numbering system may be found at <http://www.cas.org/faq.html>.”