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Naming alcohols worksheet with answers doc

Which of the following is butan-1-ol? [1201] Which of the following is butan-2-ol? [1202] Which of the following is 2-methylpropanan-1-ol? [1203] Which of the following is 2-methylpropanan-2-ol? [1204] Which of the following skeletal formulas is that of 3,3-dimethylbutan-2-ol? [1205] Which of the following skeletal formulas is that of 2,3-dimethylbutan-2-ol? [1206] Which of the following skeletal formulas is that of 3,3-dimethylbutan-1-ol? [1207] Which of the following skeletal formulas is that of 2,3-dimethylbutan-1-ol? [1208] Which of the following is 2,2-dimethylbutan-1-ol? [1209] Which of the following is 3-methylpentan-3-ol? [1210] Which of the following is 2-methylpentan-3-ol? [1211] Which of the following is 4-methylpentan-2-ol? [1212] Which of the following is 3-methylpentan-2-ol? [1213] Which of the following is 2-methylpentan-2-ol? [1214] Which of the following is 4-methylpentan-1-ol? [1215] Which of the following is 3-methylpentan-1-ol? [1216] Which of the following is 2-methylpentan-1-ol? [1217] Which of the following is hexan-3-ol? [1218] Which of the following is hexan-2-ol? [1219] Which of the following is hexan-1-ol? [1220] Which of the following is 2-methoxy-2-methylpropane? [1221] Which of the following is 1-methoxy-2-methylpropane? [1222] Which of the following is 2-ethoxypropane? [1223] Which of the following is 1-ethoxypropane? [1223] Which of the following is methanol? [1225] Which of the following is ethanol? [1226] Which of the following is methoxymetan? [1227] Which of the following is propan-1-ol? [1228] Which of the following is propan-2-ol? [1229] Which of the following is methoxyethane? [1230] Which of the following is ethane? [1231] Which of the following is propan-1-ol? [1232] Which of the following is butan-1-ol? [1233] Which of the following is butan-2-ol? [1234] Which of the following is 2-methylpropanan-1-ol? [1235] Which of the following is 2-methylpropanan-2-ol? [1236] Which of the following is pentan-1-ol? [1237] Which of the following is pentan-2-ol? [1238] Which of the following is pentan-3-ol? [1239] Which of the following is 3-methylbutan-1-ol? [1240] Which of the following is 2-methylbutan-1-ol? [1241] Which of the following is 2-methylbutan-2-ol? Which of the following is 3-methylbutan-2-ol? [1243] Which of the following is 2,2-dimethylpropan-1-ol? [1243] What is 3,3-dimethylbutan-2-ol? [1245] What is 2,3-dimethylbutan-2-ol? [1246] What is 3,3-dimethylbutan-1-ol? [1247] What is 2,3-dimethylbutan-1-ol? [1248] Which of the following is 2-ethylbutan-1-ol? [1249] Which of the following is 2,2-dimethylbutan-1-ol? [1250] Which of the following is 3-methylpentan-3-ol? [1251] Which of the following is 2-methylpentan-3-ol? [1252] Which of the following is 3-methylpentan-2-ol? [1253] Which of the following is 2-methylpentan-2-ol? [1254] Which of the following is 4-methylpentan-1-ol? [1255] Which of the following is 3-methylpentan-1-ol? [1256] Which of the following is 2-methylpentan-1-ol? [1257] Which of the following is hexan-3-ol? [1258] Which of the following is hexan-2-ol? [1259] Which of the following is hexan-1-ol? [1260] Which of the following is 2-methoxybutaan? [1261] Which of the following is 1-methoxybutaan? [1262] Which of the following is 2-methoxypropane? [1263] Which of the following is 1-methoxypropane? [1264] Which of the following is ethane? [1265] Which of the following is methoxyethane? [1266] Which of the following is propan-2-ol? [1267] Which of the following is 4-methylpentan-2-ol? [1268] Which of the following is 3-methylpentan-2-ol? [1269] Which of the following is 2-methylpentan-2-ol? [1270] Which of the following is 4-methylpentan-1-ol? [1271] Which is the right name for ? [1272] 3-methylpentan-1-ol 3-methylhexan-1-ol 4-methylhexan-1-ol 4-methylpentan-1-ol What is the correct name for? [1273] heptan-1-ol pentan-1-ol 5-methylpentan-1-ol Who is the right name for? [1274] 1-methoxy-2-methylpropane 2-methoxy-1-methylpropane 2-methoxy-2-methylane 2,2-dimethylpropan-1-ol What is the correct name for ? [1275] 1-ethoxy-2-methyl propane 2-methoxy-2-methyl propane 1-methoxy-2-ethyl propane 1-methoxy-2-methylpropane What is the correct name for ? [1276] propan-1-ol butan-1-ol butanol propanol Which is the correct name for? [1277] methoxyethane methoxymetmetoxymetanethoxyethane That's the right name for? [1278] ethenol methanol ethanol alcohol Which is the right name for? [1279] ethanol hydroxyethane methylol methanol Which is the correct name for? What's the right name for? [1281] ethoxyethane methoxyetheneethythane methoxymethane That's the right name for? [1282] methoxyethethmetanethoxyethene methoxymethane That's the right name for? [1283] propanol 1-methylpropan-1-ol butan-1-ol propan-1-ol Which is the correct name for? [1284] methoxymetan ethoxymethane methoxyethyan ethane that's the right name for? [1285] etenol ethanol methylol methanol What is the correct name for it? [1286] ethanol methan-1-ol methanol methylol Which is the correct name for? [1287] 2-methylethanol propanol butan-2-ol propan-2-ol Which is the correct name for? [1288] methoxyethyene methoxymetmetanethmethymethmethane that's the right name for? [1289] methoxyethethyentethoxymetaan methoxymethane That's the right name for? [1290] chloretethenol 2-hydroxychlorrethane 2-chloroethane ethanol chloride That's the right name for? [1291] 1-chloropropan-2-ol 2-chloropropan-2-ol 1-chloropropan-1-ol 2-chloropropan-1-ol What is the correct name for it? [1292] 3-chloropropan-1-ol 1-chloropropan-3-ol 3-chlorobutan-1-ol 1-chlorobutan-3-ol What is the correct name for it? [1293] 2-chloropropan-2-ol 1-chloropropan-2-ol 3-chloropropan-2-ol 1-chlorobutan-2-ol What is the correct name for it? [1294] 3-chloropropan-1-ol 1-chlorobutan-2-ol 2-chlorobutan-1-ol 2-chloropropan-1-ol What is the correct name for it? [1295] 3-chlorobutan-4-ol 2-chlorobutan-1-ol 2-chlorobutan-2-ol 3-chlorobutan-1-ol What is the correct name for it? [1296] 4-chlorobutan-1-ol 1-chlorobutan-4-ol 3-chloropropan-1-ol 1-chloropropan-3-ol What is the correct name for it? [1297] 4-chlorobutan-2-ol 1-chlorobutan-2-ol 4-chlorobutan-3-ol 2-chlorobutan-3-ol What is the correct name for it? [1298] 2-chlorobutan-3-ol 3-chlorobutan-3-ol 3-chlorobutan-2-ol 2-chlorobutan-2-ol What is the correct name for it? [1299] 2-chlorobutan-3-ol 1-chlorobutan-2-ol 1-chlorobutan-4-ol 4-chlorobutan-2-ol What is the correct name for it? [130] 1-chlorine-2-methylpropan-2-ol 2-chloro-2-methylpropan-2-ol 2-chloro-1-methylpropan-2-ol 1-chloro-1-methylpropan-2-ol What is the correct name for ? [1301] 1-chlorine-1-methylpropan-1-ol 2-chlorine-2-methylpropan-1-ol 1-chloro-1-methylpropan-2-ol 2-chloro-2-methylpropan-2-ol What is the correct name for ? [1302] 1-chlorine-2-methylpropan-3-ol 2-chloro-3-methylpropan-1-ol 3-chloro-2-methylpropan-1-ol 3-chloro-2-methylpropan-2-ol Learning Objectives Identify the overall structure for an alcohol. Identify the structural function that classifies alcohols as primary, secondary, or tertiary. Name alcohols with both common names and IUPAC names alcohol is an organic compound with a hydroxyl (OH) functional group on an aliphatic carbon atom. Because OH is the functional group of all alcohols, we often represent alcohols by the general formula ROH, where R is an alkyl group. Alcohols are common in nature. Most people are familiar with ethyl alcohol (ethanol), the active ingredient in alcoholic beverages, but this compound is just one of a family of organic compounds known as alcohols. The family also includes known substances such as cholesterol and carbohydrates. Methanol (CH3OH) and ethanol (CH3CH2OH) are the first two members of the homologous series of alcohols. Alcohols with one to four carbon atoms are often mentioned by common names, in which the name of the alkyl group is followed by the word alcohol: According to the International Union of Pure and Applied Chemistry (IUPAC), the alcohols are called by changing the end of the parent alkane name to -ol. Here are some basic IUPAC rules for naming alcohols: The longest continuous chain (LCC) of carbon atoms containing the OH group is taken as the parent compound - an alkane with the same number of carbon atoms. The chain is numbered from the end closest to the OH group. The number indicating the position of the OH group is predetermined by the name of the parent hydrocarbon, and the -e-end of the parent alkane is replaced by the suffix -ol. (In cyclic alcohols, the carbon atom with the OH group is referred to as C1, but the 1 is not used in the name.) Substituents are named and numbered as in alkanen. If there is more than one OH group in the same molecule (polyhydroxy alcohols), suffixes such as -diol and triol are used. In these cases, the e-end of the parent alkane is preserved. Figure \(\PageIndex{1}\)) shows some examples of how these rules apply. Image \(\PageIndex{1}\)): IUPAC Alcohol Rules. The names and structures of some alcohols demonstrate the use of IUPAC rules. Example \(\PageIndex{1}\)): Give the IUPAC name for each connection. HOCH2CH2CH2CH2CH2OH solution Ten carbon atoms in the LCC make the connection a derivative of decane (rule 1), and the OH on the third carbon atom makes it a 3-decanol (rule 2). The carbon atoms are numbered from the end closest to the OH group. That fixes the two methyl (CH3) groups on the sixth and eighth positions. The name is 6,8-dimethyl-3-decanol (not 3,5-dimethyl-8-decanol). Five carbon atoms in the LCC make the compound a derivative of pentane. Two OH groups on the first and fifth carbon atoms make the connection a diol and give the name 1,5-pentanediol (rule 3). Exercise \(\PageIndex{1}\)) Give the IUPAC name for each Example \(\PageIndex{2}\)) Draw the structure for each connection. 2-hexanol 3-methyl-2-pentanol solution The end -ol gives an alcohol (the OH functional group), and the hex strain tells us that there are six carbon atoms in the LCC. We start with a chain of six carbon atoms: –C–C–C–C–C–C–C–C–C The 2 indicates that the OH group is attached to the second carbon atom. Finally, we add enough hydrogen atoms to give each carbon atom four bonds. The end -ol gives an OH functional group, and the pent strain tells us that there are five carbon atoms in the LCC. We start by drawing a chain of five carbon atoms: –C–C–C–C–C–C– The numbers indicate that there is a methyl group (CH3) on the third carbon atom and an OH group on the second carbon atom. Exercise \(\PageIndex{2}\)) Draw the structure for each connection. Some of the properties of alcohols depend on the number of carbon atoms attached to the specific carbon atom attached to the OH group. Alcohols can be grouped into three classes on this basis. A primary (1°) alcohol is an alcohol in which the carbon atom (in red) with the OH group is attached to another carbon atom (in blue). The general formula is RCH2OH. A secondary (2°) alcohol is one in which the carbon atom (in red) with the OH group is attached to two other carbon atoms (in blue). The general formula is R2CHOH. A tertiary (3°) alcohol is one in which the carbon atom (in red) with the OH group is attached to three other carbon atoms (in blue). The general formula is R3COH. Table \(\PageIndex{1}\)) names and classifies some of the simpler alcohols. Some of the common names reflect the classification of a compound as secondary (secondary) or tertiary (tert-). These designations are not used in the IUPAC alcohol nomenclature system. Note that there are four butyl alcohols in the table, which corresponds to the four butyl groups: the butyl group (CH3CH2CH2CH2) that was previously discussed, and three others: Table \(\PageIndex{1}\)): Classification and Nomenclature of some alcohols Condensed Structural Formula Class of Alcohol common name IUPAC Name CH3OH — methyl alcohol methanol CH3CH2OH primary ethyl alcohol ethanol CH3CH2CH2OH primary propyl alcohol 1-propanol (CH3)2CHOH secondary isopropyl alcohol 2-propanol CH3CH2CH2CH2OH primary butyl alcohol 1-butanol CH3CH2CHOHCH3 secondary sec-butyl alcohol 2-butanol (CH3)2CHCH2OH primary isobutyl alcohol 2-methyl-1-propanol (CH3)3COH tertiary tert-butyl alcohol 2-methyl-2-propanol secondary cyclohexyl alcohol cyclohexanol In the IUPAC system, alcohols are called by changing the end of the parent alkane's name to -ol. Alcohols are classified according to the number of carbon atoms attached to the carbon atom attached to the OH group. Concept Review Exercises Is Isobutyl Alcohol Primary, Secondary, or Tertiary? Explain. What is the LCC in 2-ethyl-1-hexanol? What is taken if the LCC is in naming the compound? Explain. primary; the carbon atom with the OH group is attached to only one other carbon atom 7 carbon atoms; The 6-atom chain contains the carbon atom with the OH-group Exercises Name each alcohol and classify it primary, secondary or tertiary. CH3CH2CH2CH2CH2CH2CH2OH Name each alcohol and classify it as primary, secondary or tertiary. Draw the structure for each alcohol. 3-hexanol 3,3-dimethyl-2-butanol cyclobutanol draw the structure for each alcohol. cyclopentanol 4-methyl-2-hexanol 4,5-dimethyl-3-heptanol 1-hexanol; primary 3-hexanol; secondary 3,3-dibromo-2-methyl-2-butanol; tertiary tertiary