Roger Frost's Organic Chemistry

Topics in Roger Frost's Organic Chemistry

You'll soon find the best of numerous ways to access the animation in Roger Frost's Organic Chemistry. You can choose to teach using your A level exam headings or chemistry headings (such as oxidation; nomenclature). There are topic subsets for secondary level, biology and the alphabetic list shown here.

- **alkanes - fuels**
- **alkanes & alkenes**
- **alcohols**
- **amides**
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- **carbonyl compounds**
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- **DNA**
- **halogenoalkanes**
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- **nitriles**
- **polymers**
- **proteins and enzymes**
- **reaction pathways**

alkanes - fuels

- fuels - formation of oil
- fuels - fractional distillation
- fuels - fractional distillation - exercise
- alkanes - reactions - combustion
- fuels - octane rating
- fuels - catalytic converter
- fuels - supply and demand
- fuels - isomerisation of alkanes for fuel
- fuels - cracking alkanes for fuel
- carbon compounds - thermal cracking of alkanes
- carbon compounds - reforming alkanes for fuel
- fuels - air pollution
- fuels - acid rain

alkanes - alkenes – see also fuels

- alkanes - structure - homologous series
- hydrocarbons - introduction
- alkanes - cycloalkanes - structure
- alkanes - IUPAC nomenclature
- alkanes - IUPAC nomenclature - parent name
- alkanes - IUPAC nomenclature - longest chain
- alkanes - IUPAC nomenclature - numbering chains
- alkanes - IUPAC nomenclature - substituents
- alkanes - IUPAC nomenclature - exercise
- alkanes - reactions - combustion
- alkanes - reactions - chlorination of methane
- alkanes - free radical substitution - chlorination
- alkanes - free radical substitution - chlorination - summary
- alkanes - free radical substitution - chain reaction
- alkanes - free radical substitution – exercise
- alkanes - free radical substitution - bromination – exercise
- alkenes - structure - homologous series
- alkenes - IUPAC nomenclature
- alkenes - IUPAC nomenclature
- alkenes - IUPAC nomenclature - exercise - cis and trans
- alkenes - boiling points
- alkenes - addition of bromine
- alkenes - addition of bromine - mechanism
- alkenes - addition of hydrogen
- alkenes - addition of hydrogen - fats
- alkenes - addition of hydrogen halide
- alkenes - addition of hydrogen halide-mechanism
- alkenes - addition of hydrogen halide - Markovnikov's rule
- alkenes - addition of water
- alkenes - addition with concentrated H2SO4 - mechanism
- alkenes - addition polymerisation
- alkenes - oxidation

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alcohols

- alcohols - homologous series - structure
- alcohols - classification I
- alcohols - classification II
- alcohols - classification - exercise
- boiling points - intermolecular forces
- alcohols - breaking the RO-H bond - reaction with sodium
- alcohols - breaking the RO-H bond - esterification
- alcohols - breaking the RO-H bond - with acyl chlorides
- alcohols - halogenation with hydrochloric acid and $ZnCl_2$
- alcohols - breaking the R-OH bond with PCl5
- alcohols - breaking the R-OH bond - with phosphorus and iodine
- alcohols - breaking the R-OH bond - with hydrogen halide
- alcohols - breaking the R-OH bond - elimination of water using heat
- alcohols - elimination of water using concentrated acid
- alcohols - elimination of water - mechanism
- alcohols - oxidation - structure
- alcohols - oxidation to aldehyde
- alcohols - carboxylic acids from alcohols and aldehydes
- alcohols - triiodomethane reaction
- alcohols - triiodomethane reaction – exercise

amides

- amides - nomenclature
- amides - physical properties
- amides - reduction
- amides - hydrolysis
- amides - form amines with bromine

amino acids

- amino acids – structure
- amino acids – optical activity
- amino acids – acids and bases
- amino acids – hydrogen bonding
- amino acids – form a peptide
- amino acids – hydrolysis of a peptide

amines

- amines - structure
- amines - classification
- amines - compared with ammonia
- amines - solubility
- amines - boiling temperature
- amines - boiling points - exercise
- amines - complex ions
- amines - acting as bases
- amines - with nitric(III) acid
- amines - form amides with acyl chlorides
- amines - coupling reaction
- amines - making amines - reduction of nitriles
- amines - making amines - reduction of nitro compounds
- amines - making amines - ammonia and halogenoalkanes

analysis and detection

- analysis and detection - mass spectrometry - fragments
- analysis and detection - mass spectrometer
- analysis and detection - mass spectrometry - exercise
- analysis and detection - infrared spectroscopy
- analysis and detection - infrared spectroscopy - fingerprint region
- analysis and detection - infrared spectroscopy - use of nujol
- analysis and detection - infrared spectroscopy - interpreting spectra
- analysis and detection - infrared spectroscopy - exercise
- analysis and detection - low resolution NMR
- analysis and detection - high resolution NMR
- analysis and detection - NMR - exercise

arenes

- arenes - introduction - benzene
- arenes - nomenclature - mono-substituted derivatives
- arenes - nomenclature - more than one substituent
- arenes - physical properties - melting and boiling points
- arenes - physical properties - solubility
- arenes - structure of benzene
- arenes - structure of benzene II
- arenes - evidence against the Kekulé structure
- arenes - hybridisation - bonding in benzene
- arenes - structure - exercise
- arenes - electrophilic aromatic substitution - examples
- arenes - electrophilic aromatic substitution - chlorination
- arenes - electrophilic aromatic substitution - bromination
- arenes - electrophilic aromatic substitution - nitration
- arenes - electrophilic aromatic substitution - sulfonation
- arenes - electrophilic aromatic substitution - Friedel - Crafts alkylation
- arenes - electrophilic aromatic substitution - Friedel - Crafts acylation
- arenes - electrophilic aromatic substitution - exercise
- arenes - methylbenzene compared with benzene
- arenes - methylbenzene - activating and deactivating substituents
- arenes - methylbenzene - directing effect of substituents
- arenes - methylbenzene - chlorination of side chain
- arenes - methylbenzene - oxidation of side chain
- arenes - phenol - acidity
- arenes - phenol - reactivity - exercise
- arenes - phenol - reactions of - OH; sodium and sodium hydroxide
- arenes - phenol - reactions of - OH; esterification
- arenes - phenol - reaction of the ring - bromination
- arenes - phenol - reaction of the ring - nitration
- arenes - phenol - test using iron(III) chloride

bonding - hybridisation

- bonding in methane - hybridisation - bond angle
- bonding in methane - hybridisation - carbon electron configuration
- bonding in methane - hybridisation - exercise
- bonding in methane - hybridisation - exercise
- bonding in ethene - hybridisation - bond angle
- bonding in ethene - hybridisation - carbon electron configuration
- bonding in benzene - hybridisation
- bonding in ethyne - hybridisation - bond angle
- bonding in ethyne - hybridisation - carbon electron configuration

carbohydrates

- carbohydrates – disaccharides
- carbohydrates – monosaccharides
- carbohydrates – polysaccharides
- carbohydrates – polysaccharides – hydrolysis
- carbohydrates – reducing sugars – Fehling"s test
- carbohydrates – a & ß glucose

carbonyl compounds

- carbonyl compounds - nomenclature
- carbonyl compounds - polarity
- carbonyl compounds - carbon - oxygen double bond
- carbonyl compounds - susceptibility to reaction
- carbonyl compounds - nucleophilic addition
- carbonyl compounds - mechanism of nucleophilic addition
- carbonyl compounds - optical isomerism - 2-hydroxypropanenitrile
- carbonyl compounds - reduction
- carbonyl compounds - oxidation
- carbonyl compounds - triiodomethane
- carbonyl compounds - Tollen's reagent
- carbonyl compounds - Fehling's solution
- carbonyl compounds - condensation reaction

carboxylic acids

- carboxylic acids - structure
- carboxylic acids - nomenclature - exercise
- carboxylic acids - dimerisation
- carboxylic acids - dissociation - weak acid
- carboxylic acids - dissociation - strong acid
- carboxylic acids - form salts
- carboxylic acids - resonance and bonding
- carboxylic acids - resonance and bonding II
- carboxylic acids - strength
- carboxylic acids - acidity of chloroacids - exercise
- carboxylic acids - making and breaking esters
- carboxylic acids - form esters
- carboxylic acids - saponification
- carboxylic acids - saponification - model
- carboxylic acids - form acyl chloride
- carboxylic acids - acid derivatives
- acid chlorides - structure
- acyl chlorides - compared with halogenoalkanes
- acid chlorides - with nucleophile
- acyl chlorides - with nucleophiles - mechanism
- acid derivatives - acid anhydride

DNA

- DNA – base pairs and nucleotides
- DNA – nucleic acids – model
- DNA – nucleic acids – structure
- DNA – transcription to mRNA
- DNA – translation of mRNA to make protein

halogenoalkanes

- halogenoalkanes - homologous series - structure
- halogenoalkanes- IUPAC nomenclature
- halogenoalkanes - classification
- halogenoalkanes - classification - exercise
- halogenoalkanes - rate of hydrolysis
- halogenoalkanes - substitution
- halogenoalkanes - elimination or substitution
- halogenoalkanes - elimination - unsymmetric halogenoalkanes
- halogenoalkanes - reaction with alkali - exercise
- halogenoalkanes - substitution reactions - polarity of C-X
- halogenoalkanes - substitution reactions - strength of C-X
- halogenoalkanes - substitution reactions - SN2
- halogenoalkanes - substitution reactions - why not SN2
- halogenoalkanes - substitution reactions - SN1
- halogenoalkanes - substitution reactions: why SN1
- halogenoalkanes - substitution reactions - exercise
- halogenoalkanes - chlorofluoroalkanes
- halogenoalkanes - depletion of the ozone layer

isomerism

- isomerism - structural isomerism - introduction I
- isomerism - structural isomerism - introduction II
- isomerism - structural isomerism - exercise - pentane
- isomerism - structural isomerism - chain isomerism
- isomerism - structural isomerism - position isomerism
- isomerism - structural isomerism - exercise
- isomerism - structural isomerism - functional group isomerism
- isomerism - stereoisomerism - geometric isomerism - bond rotation
- isomerism - stereoisomerism - geometric isomerism - restricted
- rotation
- isomerism - stereoisomerism - geometric isomerism
- isomerism - stereoisomerism - geometric isomerism - exercises
- isomerism - stereoisomerism - geometric isomerism - retinal
- isomerism - stereoisomerism - geometric isomerism - fluoroethene
- isomerism - stereoisomerism - optical isomerism - chiral carbon
- isomerism - stereoisomerism - optical isomerism - non-
- superimposable
- isomerism - stereoisomerism - optical isomerism - enantiomers
- isomerism - stereoisomerism - optical isomerism - optical activity
- isomerism - stereoisomerism - optical isomerism – limonene

nitriles - structure

- nitriles - physical properties
- nitriles - reduction
- nitriles - hydrolysis
- nitriles - making nitriles - exercises

polymers

- polymers - addition polymers II - examples
- polymers - addition and condensation
- polymers - addition polymers I - free radical
- polymers - natural polymers - rubber
- polymers - polyalkenes - stereoisomers
- polymers - condensation polymers - polyester
- polymers - condensation polymers - polyamide
- polymers - making nylon - phenol
- polymers - bakelite - phenol
- polymers - proteins - wool
- polymers - elastomer

proteins - enzymes

- proteins - primary structure
- proteins - secondary structure - interactions
- proteins - secondary structure
- proteins - secondary structure - exercise
- proteins - structure - exercise
- proteins - tertiary structure
- proteins - tertiary structure - hydrophobic groups
- proteins - secondary structure - ionic or salt bridges
- proteins - quaternary structure - haemoglobin
- proteins - secondary structure - interactions
- proteins - enzymes - secondary structure - inhibitors
- proteins - enzymes - effect of pH
- proteins - enzymes - effect of temperature
- proteins - enzymes - effect of concentration

reaction pathways

- reactions - organic synthesis – exercise
- reactions - synthesis pathways – exercise