

Volatiles

[IN01](#) [Mar96] Which compound(s) is/are broken down in soda-lime?

- A. [Nitrous oxide](#)
- B. [Halothane](#)
- C. [Sevoflurane](#)
- D. [Desflurane](#)
- E. All of the above but minimal > Carbon monoxide

[IN02](#) [Mar96]

Regarding [nitrous oxide](#) at 70%:

- A. Synthetised from ? & N₂ at 273C Manufactured by heating ammonium nitrate to 240 degrees celsius and removing impurities... by passage through scrubbers and waters
- B. Decreases muscle blood flow by 30%. does not change SVR
- C. Decreases cerebral autoregulation 24% ?that much
- D. ?

[IN02b](#) [Jul97]

[Nitrous Oxide](#):

- A. ?Increases CBF
- B. Is an effective oxidant
- C. Is made by heating nitrogen and oxygen in an iron retort
- D. Decreases pulmonary artery pressure in neonates

Nitrous oxide at 70%

- A. 99% equilibration at 3 minutes longer
- B. About 10L uptake within first 3 minutes 10-15mins
- C. Reduces muscle blood flow by 30%
- D. Decreases cerebral autoregulation by 70%
- E. ?

[IN03](#) [Mar96] [Jul96] [Jul97] [Jul98] [Jul99]

The following drugs are (potent) triggers for malignant hyperthermia EXCEPT:

- A. [Decamethonium](#)
- B. [Suxamethonium](#)
- C. [Isoflurane](#)
- D. [Halothane](#)
- E. Calcium
- F. [Sevoflurane](#)
- G. Tubocurarine NDNMB considered safe
- H. [Nitrous oxide](#) slight incr

(Different options on different papers)

[IN04](#) [Mar96] [Mar03] IPPV with [isoflurane](#) at 1 [MAC](#) results in:

- A. Depresses cardiovascular reflexes more than halothane
- B. Causes decreased conduction velocity
- C. Maintains cerebral autoregulation - up to 1 MAC
- D. Equal respiratory depression to enflurane - enflurane is worse
- E. Reduction in cardiac output by 25% - = halothane
- F. Increased vasodilatation

[IN05](#) [Mar96] [Mar98] The effect of increased cardiac output on Pa versus time for volatile agents is: PA will be reduced (Decreased FA/FI curve) due to transport away from lungs by increased C.O.

- A. No effect
- B. Decrease slope
- C. Decrease then increase slope
- D. Increase then decrease slope

[IN06](#) [Mar96] [Jul97] [Apr01]

[Nitrous oxide](#) (N₂O):

A. Supports combustion

B. Is flammable

C. Causes muscle rigidity

D. In tissues is slower to reabsorb than oxygen

E. Has a partition coefficient of 0.76

F. All of the above

G. Is formed by heating oxygen & nitrogen

H. Induces methionine synthetase

I. Oxidises the cobalt in vitamin B12 ∴ cannot act as cofactor for methionine synthase

[IN06b](#) [Mar98] [Jul98] [Nitrous oxide](#):

A. Has MW of 42 = 44

B. Critical temperature 32 C = 36.4

C. Formed by using iron as a catalyst

D. Does not support combustion

E. ?? has saturated vapour pressure of 24]] kPa = gas at 20deg ∴ no SVP

F. Produced using ammonium sulphate in an iron retort ammonium nitrate

G. Boiling point 32C = -88

H. ?? . . . ammonium nitrate . . . copper vessel ??

(Multiple options as this represents 2 separate N₂O questions on Mar98 paper)

[IN07](#) [Mar97] [Mar03] Desflurane

A. Takes 5 minutes to reach equilibrium

B. Is fastest to approach equilibrium of any inhaled anaesthetic agent

C. Is a fluorinated diethyl ether = METHYL ETHER

D. ?

IN08 [Mar97] [Jul97] Regarding sevoflurane:

- Sevo has the HIGHEST MW and BP;
- It has the LOWEST SVP;

- A. The vapour pressure is less than enflurane
- B. The vapour pressure is greater than isoflurane
- C. Cardiovascular side effects are similar to isoflurane
- D. Molecular weight less than isoflurane
- E. Boiling point greater than enflurane

IN08b [Jul97] [Feb00] Sevoflurane:

- A. Is a methylethyl ether
- B. Is odourless
- C. Is stable in soda lime at 37 degrees - **compound A**
- D. Has a boiling point higher than enflurane
- E. Has a molecular weight lower than desflurane

IN08c [Jul98] [Jul99] Sevoflurane:

- A. Molecular weight greater than enflurane
- B. MAC less than enflurane
- C. Contains Cl & F
- D. SVP > enflurane

IN09 [Mar97] [Jul98] [Jul00] Uptake of N₂O when breathing 70%:

- A. More than one litre absorbed in the first minute = **1 litre in 1st min**
- B. Equilibrium (90%) is achieved in 3mins
- C. Absorb 10 litres ?at time of ?90% equilibration / ?in first 3 mins **more like 3 litres**
- D. At steady state, uptake is 200mls/min **105mls**

E. Produces surgical anaesthesia

[IN10](#) [Mar97] [Jul98] [Mar99] [Jul01] [Jul04] N₂O causes the second gas effect because:

- A. It is relatively insoluble **des is lower 0.42 but has no 2nd gas effect**
- B. Reaches equilibrium faster than the more soluble second gas
- C. Larger volume
- D. Its high concentration **because it has a low potency ie needs >70%**

[IN11](#) [Jul97] [Desflurane](#):

- A. Is non-irritant to the airways
- B. **Is ess potent than sevoflurane**
- C. Has a higher molecular weight than ?isoflurane/?enflurane
- D. Is a chlorinated methyl ethyl ether

[IN12](#) [Jul97] [Apr01] Effects of volatile agents include:

- A. Halothane increases hepatic artery and portal blood flow
- B. Isoflurane causes hypotension by reducing cardiac output **nope by ↓SVR**
- C. ?
- D. ?

[IN12b](#) [Feb04] Volatile agents:

- A. Halothane causes less cerebral vasodilation than enflurane
- B. **Isoflurane causes less cerebral vasodilation than halothane**

[IN13](#) [Jul97] [Jul98] [Jul99] [Apr01] Problems with MAC:

- A. Large interspecies variability
- B. **Affected by temperature and other factors**
- C. Affected by obesity
- D. ?

[IN13b](#) [Mar96] [Jul98] [Feb00] [Jul01] [MAC](#):

- A. Is decreased in the elderly
- B. Is unchanged throughout pregnancy
- C. Increases in hypothermia
- D. ?Decreased/?increased with hyper/hypo-kalaemia
- E. ?

Alt version (Jul 01) All the factors decrease MAC except:

- A. Pregnancy
- B. Hyperthermia
- C. Hypothermia
- D. Hypoxia
- E. ?

[IN13c](#) [Mar99] [Apr01] [Jul01] [MAC](#):

- A. Highest between ages 2 to 5 yrs. peaks at 6months then declines till adult
- B. Increases with pregnancy
- C. MAC BAR is concentration at which 95% do not move
- D. Is 0.2% halothane in 70% N₂O 0.29%
- E. ?

Jul 01 version: With regards to MAC:

- A. The MAC of Halothane with 70%N₂O is 0.29
- B. Concentration at which 95% of patients don't move after a surgical stimulus
- C. MAC- BAR ??
- D. Decreased by increased CO₂
- E. ?

[IN14](#) [Mar98] [Mar99] Systemic vascular resistance is LEAST changed with:

- A. Isoflurane ???maybe

- B. Sevoflurane
- C. Desflurane
- D. Enflurane
- E. Halothane

[IN15](#) [Mar98] [Jul98] [Mar99] MAC awake during emergence when patient will respond to command:

- A. 0.1
- B. 0.2
- C. 0.3 general - halothane >50%, N2O 60%
- D. 0.5
- E. ?0.7 ?0.8

[IN16](#) [Jul98] [Jul99] Isoflurane & enflurane are:

- A. Structural isomers
- B. Enantiomers
- C. Diastereomers
- D. Optical isomers
- E. Configurational isomers

[IN17](#) [Mar96] [Jul96] Sevoflurane:

- A. Is broken down in the body to Compound A which has been shown to be toxic to rats
- B. Has a blood:gas partition coefficient of 2.3 = 0.65
- C. Is a irritant causing coughing on induction
- D. Has a boiling point of 24]] degrees centigrade 58.5
- E. Has Cl & F atoms in its structure - 7F no CL (des has 6F)
- F. None of the above

(Note: Compound A is a breakdown product produced in the CO2 absorber; it is not produced by biotransformation)

[IN18](#) [Mar99] [Feb00] With isoflurane anaesthesia, MAC awake is:

- A. 0.1% vol
- B. 0.3% vol**
- C. 0.5% vol
- D. 0.5% vol
- E. 1% vol

[IN19](#) [Mar99] [Jul04] Isoflurane:

- A. Is a halogenated methyl ethyl ether**
- B. Higher boiling point than sevoflurane
- C. No odour
- D. Enantiomer of enflurane

[IN20](#) [Mar99] MAC of halothane with 70% N₂O is:

- A. 0.25%**
- B. 0.5%
- C. 0.75%
- D. 1.0%

[IN21](#) [Mar99] All reduce MAC except:

- A. Aminopyridine**
- B. hypothermia
- C. pregnancy
- D. hypoxia

[IN22](#) [Jul98] N₂O is NOT relatively contra-indicated with:

- A. Pneumothorax
- B. Ear surgery
- C. Postop nausea & vomiting
- D. Renal failure is not metabolised**

[IN23](#) [Jul99] [Jul02] [Mar03] [Jul04] Which of the following does NOT affect the speed of induction with a volatile agent?

- A. FRC
- B. Obesity
- C. pCO₂
- D. Cardiac output
- E. Body mass**
- F. MAC

Alt version: Regarding the time constant for volatile anaesthetic uptake in the lungs

- A. Affected by agent concentration**
- B. Affected by obesity
- C. Not affected by FRC
- D. Affected by restrictive lung disease

[IN24](#) [Feb00] 22g of Nitrous oxide at STP occupies a volume of:

- A. 3.6 L
- B. 11.2 L**
- C. 22]] L (? or 22.4 L)
- D. 44.1 L

Alt version which probably is the same question remembered differently:

The washout of inhalational anaesthetics

- A.. Increases with elimination by the liver
- B.. Related considerably with the duration of anaesthesia**
- C. Increases in the neonates compared to an adult

[IN26](#) [Jul01] With regard to compound A:

- A. Increased production in Baralyme compared to sodalime**

- B. More likely in children
- C. Sevofluranes metabolites cause hepatotoxicity
- D. Sevoflurane is METABOLISED to Compound A in the liver
- E. ?

[IN27](#) [Jul01] Concerning the effects of various volatile agents on cerebral blood flow under conditions of 1 MAC and normocarbida:

- A. Halothane produces greater increase than enflurane
- B. Isoflurane produces greater increase than enflurane
- C. Any change produced depends upon cerebral metabolic rate
- D. Change in CBF is due to change in cardiac output
- E.

[IN28](#) [Jul01] Which of the following drugs is NOT associated with EEG epileptiform activity

- A. Propofol
- B. [Enflurane](#)
- C. ?
- D. ?
- E. ?

[IN29](#) [Jul04] Which does not increase risk of increased carboxyhaemoglobin in blood during anaesthesia?

- A. Dry absorbent - hydration prevents CO formation
- B. [Baralyme](#)
- C. Low flows
- D. [Desflurane](#)
- E. Halothane & sevo dont posses vinyl gp ∴ dont produce COHb

[IN30](#) [Jul04] The concentration effect for N₂O is due to

- A. Increased conc of N₂O

B. Faster equilibrium of N_2O than the second soluble second gas

C. ?

D. ?