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Metformin

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METFORMIN

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Chemistry 106
Section 004

Administration [8]

Metformin hydrochloride is administered orally.

Absorption [8]

50-60% of the prescribed dose will reach systemic circulation, or circulation of the blood throughout the body.

Action [8]

This drug is believed to improve the body's ability to use insulin more effectively, and increase binding of insulin to its receptors. It suppresses the production of glucose, or blood sugar, produced in the liver. This drug helps tissue to absorb the insulin, and allows the glucose to move into the skeletal muscles and fat.

Metabolism [8]

This drug is not metabolized.

Elimination [8]

This drug is eliminated through the urine.

Molar Mass [2, 6]

$$4 \text{ mol C } \left(\frac{12.01 \text{ g}}{1 \text{ mol C}}\right) = 48.04 \text{ g} \quad + \quad 1 \text{ mol H } \left(\frac{1.01 \text{ g}}{1 \text{ mol H}}\right) = 1.01 \text{ g} \quad + \quad 5 \text{ mol N } \left(\frac{14.01 \text{ g}}{1 \text{ mol N}}\right) = 70.05 \text{ g}$$

$$11 \text{ mol H } \left(\frac{1.01 \text{ g}}{1 \text{ mol H}}\right) = 11.11 \text{ g} \quad + \quad 1 \text{ mol Cl } \left(\frac{35.45 \text{ g}}{1 \text{ mol Cl}}\right) = 35.45 \text{ g}$$

$$\text{Total: } 165.66 \text{ g} / 1 \text{ mol } \text{C}_4\text{H}_{11}\text{N}_5 \cdot \text{HCl}$$

Literature Molar Mass [4]

$$165.63 \text{ g} / 1 \text{ mol } \text{C}_4\text{H}_{11}\text{N}_5 \cdot \text{HCl}$$

Solubility in Water [2, 3, 6]

Literature Value: 1.38 mg/mL

Conversion to g/100 mL:

$$\frac{1.38 \text{ mg}}{1 \text{ mL}} * \left(\frac{1 \text{ g}}{1000 \text{ mg}}\right) * (100 \text{ mL}) = 0.138 \text{ g} / 100 \text{ mL}$$

Assuming anything over 1 g solute/100 mL water (@25°C) is considered soluble in water, **Metformin hydrochloride is insoluble in water.**

Generic Name [8]

Metformin

Trade Names [8]

Fortamet, Glucophage, Glucophage XR, Glumetza, Riomet

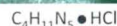
Classification [8]

Antidiabetic, Biguanide

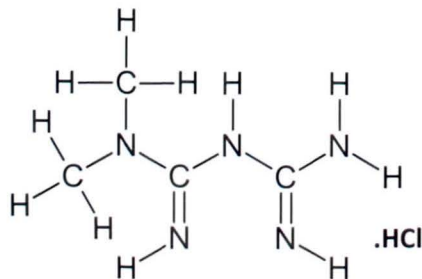
Chemical Names [4]

N,N-Dimethylimidodicarbonimidic diamide with hydrochloride; 1,1-dimethylbiguanide with hydrochloride; *N,N*-dimethylbiguanide with hydrochloride; *N'*-dimethylguanilylguanidine with hydrochloride

Chemical Formula [4]



Expanded Structural Formula [1, 4]



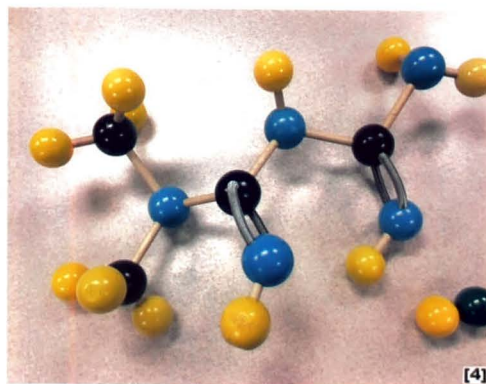
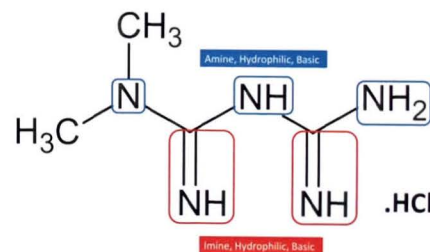
Labeled Uses [8]

Metformin HCl is used in the treatment of type 2 diabetes mellitus as adjunct to diet and exercise.

Unlabeled Uses [8]

The unlabeled uses of Metformin HCl include treatment of antipsychotic-induced weight gain, and polycystic ovary syndrome.

Condensed Structural Formula [1, 2, 4, 6]



How Drug Supplied [5]

Fortamet/Glucophage XR/ Glumetza/Metformin Hydrochloride Oral Tab ER: 500mg, 750mg, 1000mg
Glucophage/Metformin Hydrochloride Oral Tab: 500mg, 850mg, 1000mg
Riomet Oral Sol: 5mL, 500mg

Dose to Tablet Calculation [2, 5, 6, 8]

Smallest tablet dosage: 500 mg/dose
Smallest tablet size: 500 mg/tablet

$$\frac{500 \text{ mg} * (1 \text{ tablet})}{1 \text{ dose}} = \frac{1 \text{ tablet}}{500 \text{ mg}} \cdot 1 \text{ dose}$$

Route & Dosage for Type 2 Diabetes in Adult Patient [8]

Taken orally Start with 500 milligrams daily to three times a day or 850 milligrams daily to twice a day with meals, may increase by 500 to 850 milligrams per day every one to three weeks (maximum: 2550 milligrams per day); or start with 500 milligrams sustained release with evening meal, may increase by 500 milligrams per day at evening meal once a week (maximum: 2000 milligrams per day)



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