Focalin XR: Dexmethylphenidate Hydrochloride

Andrea L. Sullivan

Parkland College

Recommended Citation
http://spark.parkland.edu/nspsp/74

Open access to this Poster is brought to you by Parkland College's institutional repository, SPARK: Scholarship at Parkland. For more information, please contact spark@parkland.edu.
What does the drug do? 1.
Works on the cerebral cortex with a mild stimulant effect. Causes mild CNS and respiratory stimulation with potency between amphetamines and caffeine. Effects more prominent on mental activities than on motor activities. Also suppresses appetite.

Generic Name: 1.
Dextromethorphan Hydrochloride

Trade Names:
Focalin XR, Concerta, Daytrana, Metadate CD, Metadate ER, Methylin, Methylphenidate ER, Ritalin, Ritalin LA, Ritalin SR

Chemical Names and Formula:
d-three-Form (αR, 2R)-α-Phenyl-2-piperidine-acetic acid methyl ester; dextromethorphan d-three-hydrochloride, dextromethorphan hydrochloride

C₁₄H₁₉NO₂·HCl

How is the drug taken? 1.
Orally, swallowed whole, 30-45 min before meals and before 6 pm to avoid insomnia. Some of the capsules can be sprinkled on food. Absorbed by the GI tract, peak effect in 1.9 hours. Effects continue for 3-6 hours. In sustained release, 8 hours. Also available in a transdermal patch.

Classification: 1.
Cerebral stimulant

Uses: 1. 2.
Used in adjunctive therapy to treat symptoms of attention deficit disorder in children and adults. Also used to treat narcolepsy and in veterinary medicine to treat canine behavioral problems. Unlabeled use to treat depression.

Calculation of Molar Mass:

<table>
<thead>
<tr>
<th>Element</th>
<th>MM</th>
<th>#</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbon</td>
<td>12.0 g/mole</td>
<td>14</td>
<td>168.00 g/mole</td>
</tr>
<tr>
<td>Hydrogen</td>
<td>1.0 g/mole</td>
<td>19</td>
<td>19.0 g/mole</td>
</tr>
<tr>
<td>Nitrogen</td>
<td>14.0 g/mole</td>
<td>1</td>
<td>14.0 g/mole</td>
</tr>
<tr>
<td>Oxygen</td>
<td>16.0 g/mole</td>
<td>1</td>
<td>16.0 g/mole</td>
</tr>
<tr>
<td>Chlorine</td>
<td>35.5 g/mole</td>
<td>1</td>
<td>35.5 g/mole</td>
</tr>
<tr>
<td>MM of dextromethorphan</td>
<td>269.77 g/mole</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Literature value for MM: 269.77 g/mole

Water solubility: 3.
1.82 e-01 g/l (insoluble)

However, according to all sources, dextromethorphan hydrochloride is freely soluble, but a solubility figure on dextromethorphan with hydrochloride does not seem to be available. HCl is polar (and thus water soluble) so it is possible that the addition of the HCl makes dextromethorphan hydrochloride soluble.

Andrea Sullivan
Parkland College
CHE106-04

Dosing: 1.
For extended release (XR), 20-40 mg daily taken by mouth before breakfast, up to a maximum of 72 mg per day. For regular release, 5-10 mg by mouth before breakfast and lunch, with gradual increase of 5-10 mg per week, as needed, up to a maximum of 72 mg per day.

Chosen dosage: 5 mg
Availability: 1.
- Tablets: 5 mg, 10 mg, 20 mg
- Chewable tablets: 2.5 mg, 5 mg, 10 mg
- Oral solution: 5mg/5ml, 10 mg/5 ml
- Sustained release capsules: 10 mg, 20 mg, 30 mg, 40 mg, 50 mg, 60 mg
- Sustained release tablets: 10 mg, 18 mg, 20 mg, 27 mg, 36 mg, 54 mg
- Transdermal patch: 10 mg, 15 mg, 20 mg, 30 mg

Molecules per chosen dose: 2.
X molecules of C₁₄H₁₉NO₂·HCl =

5 mg C₁₄H₁₉NO₂·HCl = 34 molecules of C₁₄H₁₉NO₂·HCl

5 mg C₁₄H₁₉NO₂·HCl = 10 molecules of C₁₄H₁₉NO₂·HCl

1.15765263 x 10^10 molecules of C₁₄H₁₉NO₂·HCl

Rounded to 1 sig fig = 1 x 10^10 molecules of C₁₄H₁₉NO₂·HCl

X tablets = 5 mg C₁₄H₁₉NO₂·HCl
1 tablet C₁₄H₁₉NO₂·HCl = 0.001 mg C₁₄H₁₉NO₂·HCl

Therefore, 5 mg C₁₄H₁₉NO₂·HCl = 1 tablet

References: