|  |  |  |  |
| --- | --- | --- | --- |
| **DERMAL** | | | |
|  | **71-43-2--benzene** | **67-68-5--DMSO** | **75-09-2--caffeine** |
| LogP | 2.22 | -1.35 | -0.13 |
| Molecular weight [g/mol] | 78.112 | 78.133 | 194.191 |
| Phase | liquid | liquid | solid |

|  |  |  |  |
| --- | --- | --- | --- |
| **RESPIRATORY** | | | |
|  | **71-43-2--benzene** | **67-68-5--DMSO** | **75-09-2--caffeine** |
| LogP | 2.22 | -1.35 | -0.13 |
| Molecular weight [g/mol] | 78.112 | 78.133 | 194.191 |
| Vapor pressure [mmHg] | 100.9 | 0.8 | 0 |

|  |  |  |  |
| --- | --- | --- | --- |
| **DIGESTIVE** | | | |
|  | **71-43-2--benzene** | **67-68-5--DMSO** | **75-09-2--caffeine** |
| LogP | 2.22 | -1.35 | -0.13 |
| Molecular weight [g/mol] | 78.112 | 78.133 | 194.191 |
| Phase | liquid | liquid | Solid but liquid upon digestion |

Benzene:

* Benzene is volatile (vapor pressure 100.9 mmHg). It will most likely absorb through the respiratory system.
* Once the benzene is in the body, it has a moderate lipid and water solubility (logP=2.22), therefore some of it will absorb by digestive track.
* Since it is a liquid, it will absorb easier than solid.
* Skin absorption is less probable (logP =2.22; preferred range in between 0-6 for skin absorption)

DMSO

* DMSO—very low logP means higher water solubility and lower lipophilicity; While vapor pressure is still above suggested value, it is not as volatile as benzene therefore it is less likely to absorb through the respiratory system.
* DMSO will penetrate through skin when exposed.

Caffeine

* Caffeine– will absorb through the skin. If it is in a solid state (rather than liquid), the rate of dermal absorption will be lower.
* Increased molecular weight decreases chance of absorption in GI tract.