What is Claimed is:

1. A cocrystal of fasoracetam and a coformer wherein the coformer is not tartaric acid.
2. The cocrystal of claim 1, wherein the coformer is an organic compound and contains at least one moiety selected from $-NH_2$, $-NO_2$, alkyl, or a carbonyl-containing moiety.
3. The cocrystal as in claim 1 or claim 2, wherein the fasoracetam is R-fasoracetam.
4. A crystalline compound comprising fasoracetam and a coformer wherein the coformer is an aromatic compound.
5. A crystalline compound comprising R-fasoracetam and a coformer wherein the coformer is an aromatic compound.
6. The crystalline compound as in claim 4 or claim 5, wherein the crystalline compound is a cocrystal.
7. A cocrystal of fasoracetam and a coformer wherein the coformer is an aromatic compound.
8. A cocrystal of R-fasoracetam and a coformer wherein the coformer is an aromatic compound.
9. The cocrystal as in claim 7 or claim 8, wherein the aromatic compound has at least one substituent.
10. The cocrystal of claim 9, wherein the at least one substituent is chosen from -OH, $-NH_2$, alkyl, $-NO_2$, and carbonyl-containing moieties.
11. The cocrystal of claim 10, wherein the carbonyl-containing moiety is an organic acid moiety.
12. The cocrystal of claim 11, wherein the organic acid moiety is chosen from C_1-C_4 organic acids.
13. The cocrystal of claim 12, wherein the organic acid moiety is -COOH.
14. The cocrystal of claim 10, wherein the at least one substituent is an -OH moiety.

15. The cocrystal of claim 10, wherein the at least one substituent is chosen from ester and alkyl moieties.

16. The cocrystal of claim 15, wherein the ester is chosen from C_1-C_5 esters.

17. The cocrystal of any one of claims 9-16, wherein the aromatic compound has two substituents.

18. The cocrystal of any one of claims 9-16, wherein the aromatic compound has three substituents.

19. The cocrystal of any one of claims 9-16, therein the aromatic compound has four substituents.

20. The cocrystal of claim 17, wherein there are two substituents and each substituent is independently chosen from -OH, $-NH_2$, alkyl, organic acid, ester, and $-NO_2$ moieties.

21. The cocrystal of claim 20, wherein a first substituent is an organic acid and a second substituent is chosen from -OH, $-NH_2$, alkyl, organic acid, ester, and $-NO_2$ moieties.

22. The cocrystal of claim 21, wherein the second substituent is an $-NH_2$ moiety.

23. The cocrystal of claim 22, wherein the $-NH_2$ moiety and the organic acid moiety are ortho to one another.

24. The cocrystal of claim 22, wherein the $-NH_2$ moiety and the organic acid moiety are meta to one another.

25. The cocrystal of claim 22, wherein the $-NH_2$ moiety and the organic acid moiety are para to one another.

26. The cocrystal of claim 21, wherein the second substituent is an $-NO_2$ moiety.

27. The cocrystal of claim 26, wherein the $-NO_2$ moiety and the organic acid moiety are ortho to one another.

28. The cocrystal of claim 26, wherein the $-NO_2$ moiety and the organic acid moiety are meta to one another.

29. The cocrystal of claim 26, wherein the -NO_2 moiety and the organic acid moiety are para to one another.

30. The cocrystal of claim 21, wherein the second substituent is an -OH moiety.

31. The cocrystal of claim 30, wherein the -OH moiety and the organic acid moiety are ortho to one another.

32. The cocrystal of claim 30, wherein the -OH moiety and the organic acid moiety are meta to one another.

33. The cocrystal of claim 30, wherein the -OH moiety and the organic acid moiety are para to one another.

34. The cocrystal of claim 21, wherein the second substituent is an alkyl moiety.

35. The cocrystal of claim 34, wherein the alkyl moiety and the organic acid moiety are ortho to one another.

36. The cocrystal of claim 34, wherein the alkyl moiety and the organic acid moiety are meta to one another.

37. The cocrystal of claim 34, wherein the alkyl moiety and the organic acid moiety are para to one another.

38. The cocrystal of claim 21, wherein the second substituent is an organic acid moiety.

39. The cocrystal of claim 38, wherein the two organic acid moieties are ortho to one another.

40. The cocrystal of claim 38, wherein the two organic acid moieties are meta to one another.

41. The cocrystal of claim 38, wherein the two organic acid moieties are para to one another.

42. The cocrystal of claim 21, wherein the second substituent is an ester moiety.

43. The cocrystal of claim 42, wherein the ester moiety and the organic acid moiety are ortho to one another.

44. The cocrystal of claim 42, wherein the ester moiety and the organic acid moiety are meta to one another.

45. The cocrystal of claim 42, wherein the ester moiety and the organic acid moiety are para to one another.

46. The cocrystal of claim 18, wherein there are three substituents and each substituent is independently chosen from -OH, $-NH_2$, alkyl, organic acid, ester, and $-NO_2$ moieties.

47. The cocrystal of claim 46, wherein a first substituent is -OH.

48. The cocrystal of claim 47, wherein a second and third substituents are -OH.

49. The cocrystal of claim 46, wherein a first substituent is an organic acid moiety.

50. The cocrystal of claim 49, wherein a second and third substituents are organic acid moieties.

51. The cocrystal of any one of claims 49-50, wherein the organic acid moiety is -COOH.

52. The cocrystal of claims 19, wherein there are four substituents and each substituent is independently chosen from -OH, $-NH_2$, alkyl, organic acid, ester, and $-NO_2$ moieties.

53. The cocrystal of claim 52, wherein a first substituent is an ester moiety or an organic acid moiety.

54. The cocrystal of claim 53, wherein the ester is a methyl ester.

55. The cocrystal of claim 53, wherein the ester is an ethyl ester.

56. The cocrystal of any one of claims 53-55, wherein a second substituent is an -OH moiety.

57. The cocrystal of any one of claims 53-55, wherein a second, a third and a fourth substituent are each an -OH moiety.

58. The cocrystal of any one of claims 7-22, wherein the aromatic compound is polycyclic.

59. The cocrystal of any one of claims 26, 30, 34, 42, 46, and 49-57, wherein the aromatic compound is polycyclic.

60. The cocrystal of any one of claims 58-59, wherein the polycyclic aromatic compound is two six-member rings.

61. The cocrystal of any one of claims 58-59, wherein the polycyclic aromatic compound is a six-member ring and a five-member ring.

62. The cocrystal of any one of claims 7-61, wherein the ring atoms of the aromatic compound are all carbon.

63. The cocrystal of any one of claims 7-61, wherein at least one ring atom of the aromatic compound is not carbon.

64. The cocrystal of claim 63, wherein at least one ring atom is nitrogen.

65. The cocrystal of any one of claims 58-59, wherein there is one substituent on the polycyclic aromatic compound.

66. The cocrystal of claim 65, wherein the substituent is chosen from C_1-C_4 organic acid moieties.

67. The cocrystal of claim 66, wherein the acid is a C_2 acid moiety.

68. The crystalline compound of any one of claims 4-5, wherein the aromatic compound is substituted.

69. The crystalline compound of claim 68, wherein there is at least one substituent.

70. The crystalline compound of claim 69, wherein the at least one substituent is chosen from -OH, -NH_2, alkyl, -NO_2, and carbonyl-containing moieties.

71. The crystalline compound of claim 70, wherein the at least one substituent is an organic acid moieties.

72. The crystalline compound of claim 71, wherein the organic acid is chosen from C_1-C_4 organic acid moiety.

73. The crystalline compound of claim 72, wherein the organic acid moiety is -COOH.

74. The crystalline compound of claim 70, wherein the at least one substituent is an -OH moiety.

75. The crystalline compound of claim 70, wherein the at least one substituent is chosen from ester and alkyl moieties.

76. The crystalline compound of claim 75, wherein the ester is chosen from C_1-C_4 esters.

77. The crystalline compound of any one of claims 69-76, wherein the aromatic compound has two substituents.

78. The crystalline compound of any one of claims 69-76, wherein the aromatic compound has three substituents.

79. The crystalline compound of any one of claims 69-76, therein the aromatic compound has four substituents.

80. The crystalline compound of claim 77, wherein there are two substituents and each substituent is independently chosen from -OH, $-NH_2$, alkyl, organic acid, ester, and $-NO_2$ moieties.

81. The crystalline compound of claim 80, wherein a first substituent is an organic acid and a second substituent is chosen from -OH, $-NH_2$, alkyl, organic acid, ester, and $-NO_2$ moieties.

82. The crystalline compound of claim 81, wherein the second substituent is an $-NH_2$ moiety.

83. The crystalline compound of claim 80, wherein the $-NH_2$ moiety and the organic acid moiety are ortho to one another.

84. The crystalline compound of claim 80, wherein the $-NH_2$ moiety and the organic acid moiety are meta to one another.

85. The crystalline compound of claim 80, wherein the -NH_2 moiety and the organic acid moiety are para to one another.

86. The crystalline compound of claim 81, wherein the second substituent is an -NO_2 moiety.

87. The crystalline compound of claim 86, wherein the -NO_2 moiety and the organic acid moiety are ortho to one another.

88. The crystalline compound of claim 86, wherein the -NO_2 moiety and the organic acid moiety are meta to one another.

89. The crystalline compound of claim 86, wherein the -NO_2 moiety and the organic acid moiety are para to one another.

90. The crystalline compound of claim 81, wherein the second substituent is an -OH moiety.

91. The crystalline compound of claim 90, wherein the -OH moiety and the organic acid moiety are ortho to one another.

92. The crystalline compound of claim 90, wherein the -OH moiety and the organic acid moiety are meta to one another.

93. The crystalline compound of claim 90, wherein the -OH moiety and the organic acid moiety are para to one another.

94. The crystalline compound of claim 81, wherein the second substituent is an alkyl moiety.

95. The crystalline compound of claim 94, wherein the alkyl moiety and the organic acid moiety are ortho to one another.

96. The crystalline compound of claim 94, wherein the alkyl moiety and the organic acid moiety are meta to one another.

97. The crystalline compound of claim 94, wherein the alkyl moiety and the organic acid moiety are para to one another.

98. The crystalline compound of claim 81, wherein the second substituent is an organic acid moiety.

99. The crystalline compound of claim 98, wherein the two organic acid moieties are ortho to one another.

100. The crystalline compound of claim 98, wherein the two organic acid moieties are meta to one another.

101. The crystalline compound of claim 98, wherein the two organic acid moieties are para to one another.

102. The crystalline compound of claim 81, wherein the second substituent is an ester moiety.

103. The crystalline compound of claim 102, wherein the ester moiety and the organic acid moiety are ortho to one another.

104. The crystalline compound of claim 102, wherein the ester moiety and the organic acid moiety are meta to one another.

105. The crystalline compound of claim 102, wherein the ester moiety and the organic acid moiety are para to one another.

106. The crystalline compound of any one of claims 77-78, wherein there are three substituents and each substituent is independently chosen from -OH, $-NH_2$, alkyl, organic acid, ester, and $-NO_2$ moieties.

107. The crystalline compound of claim 106, wherein a first substituent is an -OH moiety.

108. The crystalline compound of claim 107, wherein a second and third substituents are -OH moieties.

109. The crystalline compound of claim 106, wherein a first substituent is an organic acid moiety.

110. The crystalline compound of claim 106, wherein a second and third substituents are organic acid moieties.

111. The crystalline compound of any one of claims 109-110, wherein the organic acid moiety is -COOH.

112. The crystalline compound of any one of claims 77-79, wherein there are four substituents and each substituent is independently chosen from -OH, $-NH_2$, alkyl, organic acid, ester, and $-NO_2$ moieties.

113. The crystalline compound of claim 112, wherein a first substituent is an ester.

114. The crystalline compound of claim 113, wherein the ester is a methyl ester.

115. The crystalline compound of claim 113, wherein the ester is an ethyl ester.

116. The crystalline compound of any one of claims 113-115, wherein a second substituent is an -OH moiety.

117. The crystalline compound of any one of claims 113-115, wherein a second, a third and a fourth substituent are each an -OH moiety.

118. The crystalline compound of any one of claims 4-5, wherein the aromatic compound is polycyclic.

119. The crystalline compound of any one of claims 68-90, wherein the aromatic compound is polycyclic.

120. The crystalline compound of any one of claims 118-119, wherein the polycyclic aromatic is two six-member rings.

121. The crystalline compound of any one of claims 118-119, wherein the polycyclic aromatic is a six-member ring and a five-member ring.

122. The crystalline compound of any one of claims 4-5, or 68-121, wherein the ring atoms of the aromatic compound are all carbon.

123. The crystalline compound of any one of claims 4-5, or 68-121, wherein at least one ring atom is not carbon.

124. The crystalline compound of claim 123, wherein at least one ring atom is nitrogen.

125. The crystalline compound of any one of claims 118-124 wherein there is one substituent on the polycyclic aromatic compound.

126. The crystalline compound of claim 125, wherein the substituent is chosen from C_1-C_4 organic acid moieties.

127. The crystalline compound of claim 126, wherein the organic acid moiety is a C_2 acid.

128. A crystalline compound comprising fasoracetam and 4-aminobenzoic acid.

129. The crystalline compound of claim 128, wherein the fasoracetam is R-fasoracetam.

130. A cocrystal of fasoracetam and 4-aminobenzoic acid.

131. A cocrystal of R-fasoracetam and 4-aminobenzoic acid.

132. The cocrystal of claim 130, wherein the stoichiometric ratio of fasoracetam to 4-aminobenzoic acid is about 1:1.

133. The cocrystal of claim 130, wherein the molar ratio of fasoracetam to 4-aminobenzoic acid in a unit cell of the cocrystal is 1:1.

134. The cocrystal of claim 131, wherein the stoichiometric ratio of R-fasoracetam to 4-aminobenzoic acid is about 1:1.

135. The cocrystal of claim 131, wherein the molar ratio of R-fasoracetam to 4-aminobenzoic acid in a unit cell of the cocrystal is 1:1.

136. The cocrystal of any one of claims 131, or 134-135, wherein the cocrystal has an x-ray powder diffraction pattern comprising a peak at about 6.5°2Θ.

137. The cocrystal of any one of claims 131, or 134-135, wherein the cocrystal has an x-ray powder diffraction pattern comprising a peak at about 10.5°2Θ.

138. The cocrystal of any one of claims 131, or 134-135, wherein the cocrystal has an x-ray powder diffraction pattern comprising a peak at about 11.3°2Θ.

139. The cocrystal of any one of claims 131, or 134-135, wherein the cocrystal has an x-ray powder diffraction pattern comprising a peak at about 12.0°2Θ.

140. The cocrystal of any one of claims 131, or 134-135, wherein the cocrystal has an x-ray powder diffraction comprising one or more peaks chosen from peaks at about 6.5°2Θ, about 10.5°2Θ, about 11.3°2Θ, and about 12.0°2Θ.

141. The cocrystal of any one of claims 131, or 134-135, wherein the cocrystal has an x-ray powder diffraction pattern comprising one or more peaks chosen from peaks at about 6.5°2Θ, about 10.5°2Θ, about 11.3°2Θ, about 12.0°2Θ, about 13.4°2Θ, about 13.7°2Θ, about 17.4°2Θ, about 18.1°2Θ, about 18.7°2Θ, about 19.6°2Θ, about 20.6°2Θ, about 21.1°2Θ, about 21.4°2Θ, about 22.8°2Θ, about 23.2°2Θ, and about 23.7°2Θ.

142. The cocrystal of any one of claims 131, 134-135, wherein the cocrystal has a melting temperature of about 114°C.

143. The cocrystal of claim 142, wherein the onset melting temperature is measured by differential scanning calorimetry.

144. The cocrystal of any one of claims 131, or 134-135, wherein the cocrystal has an x-ray powder diffraction pattern comprising a peak at about 6.5°2Θ and an onset melting temperature of about 114°C.

145. The cocrystal of any one of claims 131, or 134-135, wherein the cocrystal has an x-ray powder diffraction pattern comprising a peak at about 10.5°2Θ and an onset melting temperature of about 114°C.

146. The cocrystal of any one of claims 131, or 134-135, wherein the cocrystal has an x-ray powder diffraction pattern comprising a peak at about 11.3°2Θ and an onset melting temperature of about 114°C.

147. The cocrystal of any one of claims 131, or 134-135, wherein the cocrystal has an x-ray powder diffraction pattern comprising a peak at about 12.0°2Θ and an onset melting temperature of about 114°C.

148. The cocrystal of any one of claims 131, or 134-135, wherein the cocrystal has an x-ray powder diffraction pattern comprising one or more peaks at 6.5°2Θ, about 10.5°2Θ, about 11.3°2Θ, or about 12.0°2Θ and has an onset melting point temperature of about 114°C.

149. The cocrystal of any one of claims 131, or 134-135, wherein the cocrystal has an x-ray powder diffraction pattern comprising one or more peaks chosen from peaks at about 6.5°2Θ, about 10.5°2Θ, about 11.3°2Θ, about 12.0°2Θ, about 13.4°2Θ, about 13.7°2Θ, about 17.4°2Θ, about 18.1°2Θ, about 18.7°2Θ, about 19.6°2Θ, about 20.6°2Θ, about 21.1°2Θ, about 21.4°2Θ, about 22.8°2Θ, about 23.2°2Θ, and about 23.7°2Θ and has an onset melting point temperature of about 114°C.

150. The cocrystal of any one of claims 131, or 134-135, wherein the cocrystal has an x-ray powder diffractogram substantially the same as that of Figure 1.

151. The cocrystal of any one of claims 131, or 134-135, wherein the differential scanning calorimetry thermogram is substantially the same as that of Figure 4.

152. The cocrystal of claim 130, wherein the fasoracetam is S-fasoracetam.

153. A pharmaceutical composition comprising a cocrystal of fasoracetam and 4-aminobenzoic acid and one or more pharmaceutically acceptable excipients.

154. The pharmaceutical composition of claim 153, wherein the fasoracetam is R-fasoracetam.

155. The pharmaceutical composition of claim 153, wherein the pharmaceutical composition has an x-ray powder diffraction pattern peak at about 6.5°2Θ.

156. The pharmaceutical composition of claim 154, wherein the x-ray powder diffraction pattern comprises one or more peaks chosen from peaks at about 6.5°2Θ, about 10.5°2Θ, about 11.3°2Θ, about 12.0°2Θ, about 13.4°2Θ, about 13.7°2Θ, about 17.4°2Θ, about 18.1°2Θ, about 18.7°2Θ, about 19.6°2Θ, about 20.6°2Θ, about 21.1°2Θ, about 21.4°2Θ, about 22.8°2Θ, about 23.2°2Θ, and about 23.7°2Θ.

157. The pharmaceutical composition of claim 154, wherein the R-fasoracetam cocrystal has an onset melting point temperature of about 114°C.

158. A crystalline compound comprising fasoracetam and trimesic acid.

159. The crystalline compound of claim 158, wherein the fasoracetam is R-fasoracetam.

160. A cocrystal of fasoracetam and trimesic acid.

161. A cocrystal of R-fasoracetam and trimesic acid.

162. The cocrystal of claim 160, wherein the stoichiometric ratio of fasoracetam to trimesic acid is about 1:1.

163. The cocrystal of claim 160, wherein the molar ratio of fasoracetam to trimesic acid in a unit cell of the cocrystal is 1:1.

164. The cocrystal of claim 161, wherein the stoichiometric ratio of R-fasoracetam to trimesic acid is about 1:1.

165. The cocrystal of claim 161, wherein the molar ratio of R-fasoracetam to trimesic acid in a unit cell of the cocrystal is 1:1.

166. The cocrystal of any one of claims 161, or 164-165, wherein the cocrystal has an x-ray powder diffraction pattern comprising a peak at about 9.7°2Θ.

167. The cocrystal of any one of claims 161, or 164-165, wherein the cocrystal has an x-ray powder diffraction pattern comprising one or more peaks chosen from peaks at about

9.7°2Θ, about 10.9°2Θ, about 11.4°2Θ, about 14.6°2Θ, about 16.5°2Θ, about 17.5°2Θ, about 18.6°2Θ, about 19.4°2Θ, about 19.8°2Θ, about 21.8°2Θ, about 23.5°2Θ, about 26.7°2Θ, and about 27.3°2Θ.

168. The cocrystal of any one of claims 161, or 164-165, wherein the cocrystal has an onset melting temperature of about 96°C.

169. The cocrystal of claim 168, wherein the cocrystal has an x-ray powder diffraction pattern comprising one or more peaks chosen from peaks at about 9.7°2Θ, about 10.9°2Θ, about 11.4°2Θ, about 14.6°2Θ, about 16.5°2Θ, about 17.5°2Θ, about 18.6°2Θ, about 19.4°2Θ, about 19.8°2Θ, about 21.8°2Θ, about 23.5°2Θ, about 26.7°2Θ, and about 27.3°2Θ.

170. The cocrystal of any one of claims 161, or 164-165, wherein the cocrystal has substantially the same x-ray powder diffraction pattern as Figure 51.

171. The cocrystal of any one of claims 161, or 164-165, wherein the cocrystal has substantially the same DSC thermogram as Figure 54.

172. A crystalline compound comprising R-fasoracetam and R-ibuprofen.

173. A cocrystal of R-fasoracetam and R-ibuprofen.

174. The cocrystal of claim 173, wherein the stoichiometric ratio of R-fasoracetam to R-ibuprofen is about 1:1.

175. The cocrystal of claim 173, wherein the molar ratio of R-fasoracetam to R-ibuprofen in a unit cell of the cocrystal is 1:1.

176. The cocrystal of any one of claims 173-175, wherein the cocrystal has an x-ray powder diffraction pattern comprising one or more peaks chosen from peaks at about 5.6°2Θ, about 10.5°2Θ, about 11.2°2Θ, about 12.3°2Θ, about 17.4°2Θ, about 20.1°2Θ, and about 20.6°2Θ.

177. The cocrystal of any one of claims 173-175, wherein the cocrystal has an onset melting temperature of about 115°C.

178. The cocrystal of claim 176, wherein the cocrystal has an onset melting temperature of about 115°C.

179. The cocrystal of any one of claims 173-175, having substantially the same x-ray powder diffraction pattern as Figure 57.

180. The cocrystal of any one of claims 173-175, having substantially the same DSC thermogram as Figure 61.

181. A crystalline compound comprising fasoracetam and phloroglucinol.

182. The crystalline compound of claim 181, wherein the fasoracetam is R-fasoracetam.

183. A monohydrate cocrystal of fasoracetam and phloroglucinol.

184. A monohydrate cocrystal of R-fasoracetam and phloroglucinol.

185. The cocrystal of claim 183, wherein the stoichiometric ratio of fasoracetam to phloroglucinol to water is about 1:1:1.

186. The cocrystal of claim 183, wherein the molar ratio of fasoracetam to phloroglucinol to water in a unit cell of the cocrystal is 1:1:1.

187. The cocrystal of claim 184, wherein the stoichiometric ratio of R-fasoracetam to phloroglucinol is about 1:1.

188. The cocrystal of claim 184, wherein the molar ratio of R-fasoracetam to phloroglucinol in a unit cell of the cocrystal is 1:1.

189. The cocrystal of any one of claims 184, or 187-188, wherein the cocrystal has an x-ray powder diffraction pattern having one or more peaks chosen from peaks at about 6.9°2Θ, about 10.3°2Θ, about 15.3°2Θ, about 16.2°2Θ, about 17.3°2Θ, about 21.6°2Θ, about 22.6°2Θ, and about 25.3°2Θ.

190. The cocrystal of any one of claims 184, or 187-188, having an onset melting temperature of about 58°C.

191. The cocrystal of claim 189, having an onset melting temperature of about 58°C.

192. The cocrystal of any one of claims 184, or 187-188 having substantially the same x-ray powder diffraction pattern as Figure 72.

193. A crystalline compound comprising fasoracetam and methyl-3,4,5-trihydroxybenzoate.

194. The crystalline compound of claim 193, wherein the fasoracetam is R-fasoracetam.

195. A monohydrate cocrystal of fasoracetam and methyl-3,4,5-trihydroxybenzoate.

196. A monohydrate cocrystal of R-fasoracetam and methyl-3,4,5-trihydroxybenzoate.

197. The cocrystal of claim 195, wherein the stoichiometric ratio of fasoracetam to methyl-3,4,5-trihydroxybenzoate is about 1:1.

198. The cocrystal of claim 195, wherein the molar ratio of fasoracetam to methyl-3,4,5-trihydroxybenzoate in a unit cell of the cocrystal is 1:1.

199. The cocrystal of claim 196, wherein the stoichiometric ratio of R-fasoracetam to methyl-3,4,5-trihydroxybenzoate is about 1:1.

200. The cocrystal of claim 196, wherein the molar ratio of R-fasoracetam to methyl-3,4,5-trihydroxybenzoate in a unit cell of the cocrystal is 1:1.

201. The cocrystal of any one of claims 196, or 199-200, wherein the cocrystal has an x-ray powder diffraction pattern comprising one or more peaks chosen from peaks at about 5.7°2Θ, about 10.6°2Θ, about 11.3°2Θ, about 12.7°2Θ, about 16.6°2Θ, about 18.9°2Θ, about 20.6°2Θ, about 24.3°2Θ, and about 25.0°2Θ.

202. The cocrystal of any one of claims 196, or 199-200, wherein the cocrystal has substantially the same x-ray powder diffraction pattern as Figure 75.

203. A crystalline compound comprising fasoracetam and ethyl gallate.

204. The crystalline compound of claim 203, wherein the fasoracetam is R-fasoracetam.

205. A cocrystal of fasoracetam and ethyl gallate.

206. A cocrystal of R-fasoracetam and ethyl gallate.

207. The cocrystal of claim 205, wherein the stoichiometric ratio of fasoracetam to ethyl gallate is about 1:1 or about 1:2.

208. The cocrystal of claim 205, wherein the molar ratio of fasoracetam to ethyl gallate in a unit cell of the cocrystal is 1:1 or 1:2.

209. The cocrystal of claim 206, wherein the stoichiometric ratio of R-fasoracetam to ethyl gallate is about 1:1 or about 1:2.

210. The cocrystal of claim 206, wherein the molar ratio of R-fasoracetam to ethyl gallate in a unit cell of the cocrystal is 1:1 or 1:2.

211. The cocrystal of any one of claims 206, or 209-210, wherein the cocrystal has an x-ray powder diffraction pattern comprising one or more peaks chosen from peaks at about 5.8°2Θ, about 11.3°2Θ, about 12.4°2Θ, about 15.5°2Θ, about 15.8°2Θ, about 18.2°2Θ, about 19.4°2Θ, about 22.0°2Θ, and about 24.8°2Θ and wherein the molar ratio of R-fasoracetam to ethyl gallate in a unit cell is 1:1 or wherein the stoichiometric ratio of R-fasoracetam to ethyl gallate is about 1:1.

212. The cocrystal of claim 211, wherein the molar ratio of R-fasoracetam to ethyl gallate in a unit cell is 1:1.

213. The cocrystal of claim 211, wherein the cocrystal has an onset melting temperature of about 112°C.

214. The cocrystal of claim 212, wherein the cocrystal has an onset melting point temperature of about 112°C.

215. The cocrystal of claim 206, wherein the cocrystal has an x-ray powder diffraction pattern comprising one or more peaks chosen from peaks at about 5.8°2Θ, about

7.2°2Θ, about 14.8°2Θ, about 20.4°2Θ, about 21.9°2Θ, and about 23.5°2Θ wherein the molar ratio of R-fasoracetam to ethyl gallate in a unit cell of the cocrystal is 1:2.

216. The cocrystal of claim 206, wherein the cocrystal has an x-ray powder diffraction pattern comprising one or more peaks chosen from peaks at about 5.8°2Θ, about 7.2°2Θ, about 14.8°2Θ, about 20.4°2Θ, about 21.9°2Θ, and about 23.5°2Θ wherein the stoichiometric ratio of R-fasoracetam to ethyl gallate is about 1:2.

217. A dihydrate cocrystal wherein the stoichiometric ratio of fasoracetam to ethyl gallate is about 1:2.

218. A dihydrate cocrystal wherein the molar ratio of fasoracetam to ethyl gallate in a unit cell of the cocrystal is 1:2.

219. The dihydrate cocrystal of any one of claims 217-218, wherein the cocrystal has an x-ray powder diffraction pattern comprising one or more peaks chosen from peaks at about 8.8°2Θ, about 11.2°2Θ, about 19.4°2Θ, about 19.9°2Θ, and about 24.1°2Θ.

220. The cocrystal of any one of claims 217-219, wherein the cocrystal has an onset melting temperature of about 106°C as measured by DSC.

221. The cocrystal of any one of claims 206, or 209-210, wherein the cocrystal has substantially the same x-ray powder diffraction pattern as Figure 79.

222. The cocrystal of any one of claims 206, or 209-210, wherein the cocrystal has substantially the same x-ray powder diffraction pattern as Figure 86.

223. The cocrystal of any one of claims 217-218, wherein the cocrystal has substantially the same x-ray powder diffraction pattern as Figure 88.

224. The cocrystal of any one of claims 217-218, wherein the fasoracetam is R-fasoracetam.

225. A crystalline compound comprising fasoracetam and phthalic acid.

226. The crystalline compound of claim 225, wherein the fasoracetam is R-fasoracetam.

227. A cocrystal of fasoracetam and phthalic acid.

228. A cocrystal of R-fasoracetam and phthalic acid.

229. The cocrystal of claim 227, wherein the stoichiometric ratio of fasoracetam to phthalic acid is about 1:1.

230. The cocrystal of claim 227, wherein the molar ratio of fasoracetam to phthalic acid in a unit cell of the cocrystal is 1:1.

231. The cocrystal of claim 228, wherein the stoichiometric ratio of R-fasoracetam to phthalic acid is about 1:1.

232. The cocrystal of claim 228, wherein the molar ratio of R-fasoracetam to phthalic acid in a unit cell of the cocrystal is 1:1.

233. The cocrystal of any one of claims 228, or 231-232, wherein the cocrystal has an x-ray powder diffraction pattern comprising one or more peaks chosen from peaks at about 6.1°2Θ, about 12.4°2Θ, about 15.1°2Θ, about 15.8°2Θ, about 18.1°2Θ, about 19.9°2Θ, and about 23.3°2Θ.

234. The cocrystal of any one of claims 228, or 231-232, wherein the cocrystal has an x-ray powder diffraction pattern substantially the same as that of Figure 64.

235. A crystalline compound comprising fasoracetam and 6-hydroxy-2-napthoic acid.

236. The crystalline compound of claim 235, wherein the fasoracetam is R-fasoracetam.

237. A cocrystal of fasoracetam and 6-hydroxy-2-napthoic acid.

238. A cocrystal of R-fasoracetam and 6-hydroxy-2-napthoic acid.

239. The cocrystal of claim 238, wherein the cocrystal has an x-ray powder diffraction pattern comprising a peak at about 11.2°2Θ.

240. The cocrystal of claim 238, wherein the cocrystal has an x-ray powder diffraction pattern comprising one or more peaks chosen from peaks at about 11.2°2Θ, about 14.9°2Θ, about 15.7°2Θ, about 20.1°2Θ, about 21.1°2Θ, about 23.6°2Θ, about 24.1°2Θ, about 25.0°2Θ, and about 25.5°2Θ.

241. The cocrystal of any one of claims 238-240, wherein the cocrystal has an onset melting temperature of about 120°C.

242. The cocrystal of claims 238 or 241, wherein the cocrystal has substantially the same x-ray powder diffraction pattern as Figure 93.

243. The cocrystal of any one of claims 238-240, or 242, wherein the cocrystal has substantially the same DSC thermogram as Figure 97.

244. A crystalline compound comprising fasoracetam and 4-nitrobenzoic acid.

245. The crystalline compound of claim 244, wherein the fasoracetam is R-fasoracetam.

246. A cocrystal of fasoracetam and 4-nitrobenzoic acid.

247. A cocrystal of R-fasoracetam and 4-nitrobenzoic acid.

248. The cocrystal of claim 246, wherein the stoichiometric ratio of fasoracetam to 4-nitrobenzoic acid is about 1:2.

249. The cocrystal of claim 246, wherein the molar ratio of fasoracetam to 4-nitrobenzoic acid in a unit cell of the cocrystal is 1:2.

250. The cocrystal of claim 247, wherein the stoichiometric ratio of R-fasoracetam to 4-nitrobenzoic acid is about 1:2.

251. The cocrystal of claim 247, wherein the molar ratio of R-fasoracetam to 4-nitrobenzoic acid in a unit cell of the cocrystal is 1:2.

252. The cocrystal of any one of claims 247, or 250-251, wherein the cocrystal has an x-ray powder diffraction pattern comprising one or more peaks chosen from peaks at about 6.5°2Θ, about 6.7°2Θ, about 8.9°2Θ, about 14.5°2Θ, about 15.6°2Θ, about 17.9°2Θ, about 18.6°2Θ, about 19.8°2Θ, about 23.4°2Θ, and about 26.4°2Θ.

253. The cocrystal of any one of claims 247, or 250-251, wherein the cocrystal has an x-ray powder diffraction pattern substantially the same as Figure 100.

254. The cocrystal of any one of claims 247, or 250-253, wherein the cocrystal has an onset melting temperature of about 146°C.

255. The cocrystal of any one of claims 247, or 250-253, wherein the cocrystal has a DSC thermogram substantially the same as Figure 105.

256. A crystalline compound comprising fasoracetam and 2-indole-3-acetic acid.

257. The crystalline compound of claim 256, wherein the fasoracetam is R-fasoracetam.

258. A cocrystal of fasoracetam and 2-indole-3-acetic acid.

259. A cocrystal of R-fasoracetam and 2-indole-3-acetic acid.

260. The cocrystal of claim 259, wherein the cocrystal has an x-ray powder diffraction pattern comprising a peak at about 11.8°2Θ.

261. The cocrystal of claim 259, wherein the cocrystal has an x-ray powder diffraction pattern comprising one or more peaks chosen from peaks at about 5.3°2Θ, about 7.9°2Θ, about 10.7°2Θ, about 11.8°2Θ, about 14.7°2Θ, about 15.8°2Θ, about 18.0°2Θ, about 21.9°2Θ, about 23.1°2Θ, and about 23.5°2Θ.

262. The cocrystal of any one of claims 259-261, wherein the cocrystal has an onset melting temperature of about 69°C.

263. The cocrystal of claim 259, wherein the cocrystal has an x-ray powder diffraction pattern substantially the same as Figure 107.

264. The cocrystal of any one of claims 259-261, or 263, wherein the cocrystal has a DSC thermogram substantially the same as Figure 111.

265. The cocrystal of claim 1, wherein the coformer is non-aromatic and contains at least one moiety selected from $-NH_2$, $-NO_2$, organic acids such as -COOH, -C(=O)-X, $-C(=O)-OR_1$, wherein R_1 is alkyl and X is a nitrogen containing moiety.

266. The cocrystal of claim 266, wherein R_1 is a C_1 to C_{12} alkyl.

267. The cocrystal of claim 265 or 266, wherein the non-aromatic coformer contains at least one NH_2.

268. The cocrystal of any one of claims 265-267, wherein the non-aromatic coformer contains two NH_2 moieties.

269. The cocrystal of any one of claims 265-268, wherein the fasoracetam is R-fasoracetam.

270. The cocrystal of claim 1, wherein the coformer is non-aromatic and contains at least one $-C(O)NR_2R_3$ moiety where R_2 and R_3 are independently selected from H, alkyl, substituted alkyl, and a C_1 to C_5 alcohol.

271. The cocrystal of claim 270, wherein the coformer contains one $-C(O)NR_2R_3$ moiety.

272. The cocrystal of any one of claims 270-271, wherein the alkyl and the substituted alkyl each contain independently 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, or 12 carbons.

273. The cocrystal of claim 272, wherein the substituted alkyl is substituted with at least one of halogen or nitrile.

274. The cocrystal of claim 273, wherein the halogen is bromine.

275. The cocrystal of any one of claims 270-274, wherein the alcohol is a C_2 alcohol.

276. The cocrystal of any one of claims 270-274, wherein the alkyl is a C_{11} alkyl.

277. The cocrystal of claim 1, wherein the coformer is non-aromatic and contains at least one -C(O)NX moiety where X is $=N-R_4$ where R_4 a carbonyl containing moiety.

278. The cocrystal of claim 277, wherein the carbonyl-containing moiety is an amide.

279. The cocrystal of any one of claims 270-278, wherein the fasoracetam is R-fasoracetam.

280. A crystalline compound comprising fasoracetam and urea.

281. The crystalline compound of claim 280, wherein the fasoracetam is R-fasoracetam.

282. A cocrystal of fasoracetam and urea.

283. A cocrystal of R-fasoracetam and urea.

284. The cocrystal of claim 282, wherein the stoichiometric ratio of fasoracetam to urea is about 1:1.

285. The cocrystal of claim 282, wherein the molar ratio of fasoracetam to urea in a unit cell of the cocrystal is 1:1.

286. The cocrystal of claim 283, wherein the stoichiometric ratio of R-fasoracetam to urea is about 1:1.

287. The cocrystal of claim 283, wherein the molar ratio of R-fasoracetam to urea in a unit cell of the cocrystal is 1:1.

288. The cocrystal of any one of claims 283, or 286-287, wherein the cocrystal has an x-ray powder diffraction pattern comprising a peak at about 10.4°2Θ.

289. The cocrystal of any one of claims 283, or 286-287, wherein the cocrystal has an x-ray powder diffraction pattern comprising a peak at about 14.0°2Θ or about 14.1°2Θ.

290. The cocrystal of any one of claims 283, or 286-287, wherein the cocrystal has an x-ray powder diffraction pattern comprising a peak at about 10.8°2Θ.

291. Form A of a cocrystal of R-fasoracetam and urea.

292. The Form A cocrystal of R-fasoracetam and urea of any one of claims 282-290.

293. The cocrystal of claim 291, wherein the cocrystal has an x-ray powder diffraction pattern comprising a peak at about 12.2°2Θ.

294. The cocrystal of claim 291, wherein the cocrystal has an x-ray powder diffraction pattern comprising a peak at about 16.1°2Θ.

295. The cocrystal of claim 291, wherein the cocrystal has an x-ray powder diffraction pattern comprising a peak at about 12.2°Θ and one or more peaks chosen from peaks at about 10.4°2Θ, about 10.8°2Θ, about 14.1°2Θ, about 16.1°2Θ, about 18.9°2Θ, about 22.3°2Θ, and about 22.9°2Θ.

296. The cocrystal of claim 291, wherein the cocrystal has an x-ray powder diffraction pattern comprising a peak at about 16.1°2Θ, and one or more peaks chosen from peaks at about 10.4°2Θ, about 10.8°2Θ, about 12.2°2Θ, about 14.1°2Θ, about 18.9°2Θ, about 22.3°2Θ, and about 22.9°2Θ.

297. The cocrystal of claim 291, having an x-ray powder diffraction pattern substantially the same as that of Figure 44.

298. The cocrystal of any one of claims 291, or 293-297 wherein the cocrystal has a melting onset temperature of about 91°C,

299. The cocrystal of claim 298, wherein the melting temperature is measured with DSC.

300. The cocrystal of claim 299, wherein the DSC thermogram of the cocrystal is substantially the same as that of Figure 47.

301. The cocrystal of claim 282, wherein the fasoracetam is S-fasoracetam.

302. A pharmaceutical composition comprising a cocrystal of fasoracetam and urea and one or more pharmaceutically acceptable excipients.

303. The pharmaceutical composition of claim 302, wherein the fasoracetam is R-fasoracetam.

304. The pharmaceutical composition of any one of claims 302-303, wherein the pharmaceutical composition has an x-ray powder diffraction pattern peak at about 10.4°2Θ.

305. The pharmaceutical composition of any one of claims 302-304, wherein the composition comprises a cocrystal of claims 295 or 296.

306. The pharmaceutical composition of any one of claims 302-305, wherein the R-fasoracetam cocrystal has an onset melting point temperature of about 91°C.

307. Form B of a cocrystal of R-fasoracetam and urea.

308. The cocrystal of claim 307, wherein the stoichiometry of R-fasoracetam to urea is about 1:1.

309. The cocrystal of claim 307, wherein the molar ratio of R-fasoracetam to urea in a unit cell of the cocrystal is 1:1.

310. The cocrystal of any one of claims 307-309, wherein the cocrystal has an x-ray powder diffraction pattern comprising a peak at about 11.4°2Θ.

311. The cocrystal of any one of claims 307-309, wherein the cocrystal has an x-ray powder diffraction pattern comprising a peak at about 17.5°2Θ.

312. The cocrystal of any one of claims 307-309, wherein the cocrystal has an x-ray powder diffraction pattern comprising at least two peaks chosen from the peaks at about 14.0°2Θ, about 14.5°2Θ, and about 14.9°2Θ.

313. The cocrystal of any one of claims 307-309, wherein the cocrystal has an x-ray powder diffraction pattern comprising peaks at about 14.5°2Θ and about 14.9°2Θ.

314. The cocrystal of any one of claims 307-309, wherein the cocrystal has an x-ray powder diffraction pattern comprising a peak at about 14.5°2Θ.

315. The cocrystal of any one of claims 307-309, wherein the cocrystal has an x-ray powder diffraction pattern comprising a peak at about 14.9°2Θ.

316. The cocrystal of any one of claims 307-309, wherein the cocrystal has an x-ray powder diffraction pattern comprising one or more peaks chosen from the peaks at about 11.4°2Θ, about 14.0°2Θ, about 14.5°2Θ, about 14.9°2Θ, and about 17.5°2Θ.

317. The cocrystal of any one of claims 307-309, wherein the cocrystal has an x-ray powder diffraction pattern comprising a peak at about 11.4 °2Θ and one or more peaks chosen from the peaks at about 10.4°2Θ, about 14.0°2Θ, about 14.5°2Θ, about 14.9°2Θ, about 17.5°2Θ, about 18.4°2Θ, about 18.7°2Θ, about 19.4°2Θ, about 20.1°2Θ, and about 21.1°2Θ.

318. The cocrystal of any one of claims 307-317 wherein the cocrystal has an onset melting point of about 102°C.

319. The cocrystal of claim 318, wherein the onset melting point is determined by DSC.

320. The cocrystal of any one of claims 307-309 or 318-319 wherein the cocrystal has an x-ray powder diffraction pattern substantially the same as that of Figure 37.

321. The cocrystal of any one of claims 307 to 317, or 320, wherein the cocrystal has a differential scanning calorimetry thermogram substantially the same as that of Figure 40.

322. A pharmaceutical composition comprising a Form B cocrystal of fasoracetam and urea and one or more pharmaceutically acceptable excipients.

323. The pharmaceutical composition of claim 322, wherein the fasoracetam is R-fasoracetam.

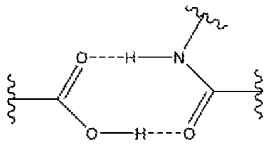
324. The pharmaceutical composition of any one of claims 322-323, wherein the pharmaceutical composition has an x-ray powder diffraction pattern peak at about 11.4°2Θ.

325. The pharmaceutical composition of any one of claims 322-323, wherein the composition has an x-ray powder diffraction pattern comprising one or more peaks wherein the cocrystal has an x-ray powder diffraction pattern comprising a peak at about 11.4°2Θ and one or more peaks chosen from the peaks at about at about 10.4°2Θ, about 14.0°2Θ, about 14.5°2Θ, about 14.9°2Θ, about 17.5°2Θ, about 18.4°2Θ, about 18.7°2Θ, about 19.4°2Θ, about 20.1°2Θ, and about 21.1°2Θ.

326. The pharmaceutical composition of any one of claims 322-325, wherein the R-fasoracetam cocrystal has an onset melting point temperature of about 102°C.

327. A cocrystal of claim 1, wherein the coformer contains at least one carboxylic acid functionality.

328. The cocrystal of claim 327, wherein the fasoracetam forms a synthon of Formula II

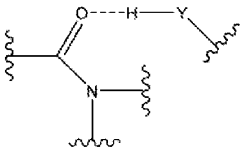


Formula II

with a carboxylic acid functionality of the coformer .

329. The cocrystal of claim 1, wherein the coformer contains at least one functionality chosen from oxygen, nitrogen, -NH, alkyl, and -(O)COR$_5$ where R$_5$ is selected from hydrogen or alkyl, such as a C$_1$ to C$_5$ alkyl.

330. The cocrystal of claim 329, wherein the fasoracetam forms a synthon of Formula III



Formula III

with the coformer .

331. The cocrystal of claim 330 wherein Y is selected from oxygen, nitrogen, -NH, and -(O)COR$_5$ where R$_5$ is selected from substituted or unsubstituted alkyl, and substituted or unsubstituted aryl.

332. The cocrystal of claim 331, wherein Y is -(O)COR$_5$ where R$_5$ is selected from substituted or unsubstituted alkyl, and substituted or unsubstituted aryl.

333. The cocrystal of any one of claims 7-22, 26, 30, 34, 42, 46, or 49-57, wherein the aromatic compound contains an aromatic ring fused to a non-aromatic cyclic moiety.

334. The cocrystal of claim 333, wherein the at least one non-aromatic cyclic moiety is partially saturated.

335. The cocrystal of claim 333, wherein there are at least two non-aromatic cyclic moieties.

336. The cocrystal of claim 333, wherein at least one non-aromatic cyclic moiety does not share ring atoms with the aromatic moiety.

337. A pharmaceutical composition comprising a crystalline compound of any one of claims 4-6, 68-129, 158-159, 172, 181-182, 193-194, 203-204, 225-226, 235-236, 244-245, 256-257, or 280-281, or a cocrystal of any one of claims 1-3, 7-67, 130-152, 160-171, 173-180, 183-192, 195-202, 205-224, 227-234, 237-243, 246-255, 258-279, 282-301, 307-321, or 327-336, and one or more pharmaceutically acceptable excipients.

338. Use of a crystalline compound of any of claims 4-6, 68-129, 158-159, 172, 181-182, 193-194, 203-204, 225-226, 235-236, 244-245, 256-257, or 280-281, a cocrystal of any of claims 1-3, 7-67, 130-152, 160-171, 173-180, 183-192, 195-202, 205-224, 227-234, 237-243, 246-255, 258-279, 282-301, 307-321, or 327-336, or a pharmaceutical composition of any of claims 153-157, 302-306, 322-326, or 337, for treatment of attention-deficit hyperactive disorder in human subject in need thereof.

339. The use according to claim 338, wherein the subject has at least one copy number variation (CNV) in a metabotropic glutamate receptor (mGluR) network gene.

340. The cocrystal of any one of claims 52-57, wherein at least one substituent is an organic acid moiety.

341. The cocrystal of claim 340, wherein the organic acid is a –COOH moiety.

342. The pharmaceutical composition according to claim 302, wherein the cocrystal of R-fasoracetam and urea is chosen from any one of claims 283-300 or 307-321.

343. A process for preparing a R-fasoracetam:urea cocrystal Form B comprising:

combining R-fasoracetam in a suitable solvent with urea to form a solution wherein the molar amount of urea to R-fasoracetam ranges from about 0.7 to about 1.2;

cooling the solution to form cocrystals of R-fasoracetam:urea cocrystal Form B.

344. The process of claim 343, wherein the R-fasoracetam is selected from the group consisting of R-fasoracetam Form I, R-fasoracetam Form II, he amorphous form of R-fasoracetam, anhydrate R-fasoracetam, and the Forms Mixture of R-fasoracetam.

345. The process of claim 344, wherein the R-fasoracetam is Form I.

346. The process of claim 343-345, wherein the suitable solvent is selected from ethyl acetate and isopropyl acetate.

347. The process of claim 346, wherein the suitable solvent is ethyl acetate.

348. The process of claim 345, wherein the ratio of suitable solvent to each gram of R-fasoracetam Form I ranges from about 2.5 ml to about 6 ml.

349. The process of claim 348, wherein the ratio of suitable solvent to each gram of R-fasoracetam Form I ranges from about 3.0 ml to about 5.0 ml.

350. The process of claim 348, wherein the ratio of suitable solvent to each gram of R-fasoracetam Form I i ranges from about 3.8 ml to about 4.6 ml.

351. The process of claims 348-350 wherein the suitable solvent comprises ethyl acetate.

352. The process of claims 343-351, wherein the temperature of the solution ranges from about 10°C-15°C.

353. The process of claims 343-351, wherein the temperature of the solution ranges from about 15°C-20°C.

354. The process of claims 343-351, wherein the temperature of the solution ranges from about 20°C-25°C.

355. The process of claims 343-351, wherein the temperature of the solution ranges from about 25°C-30°C.

356. The process of claims 343-351, wherein the temperature of the solution ranges from about 30°C-35°C.

357. The process of claims 343-351, wherein the temperature of the solution ranges from about 35°C-40°C.

358. The process of claims 343-351, wherein the temperature of the solution ranges from about 40°C-45°C.

359. The process of claims 343-351, wherein the temperature of the solution ranges from about 45°C-50°C.

360. The process of claims 343-351, wherein the temperature of the solution ranges from about 50°C-55°C.

361. The process of claims 343-351, wherein the temperature of the solution ranges from about 55°C-60°C.

362. The process of claims 343-351, wherein the temperature of the solution ranges from about 60°C-65°C.

363. The process of claims 343-351, wherein the temperature of the solution ranges from about 65°C-70°C.

364. The process of claims 343-363, wherein the urea is added stepwise.

365. The process of claims 343-363, wherein the urea is added all at once.

366. The process of claims 343-365, wherein the molar amount of urea to R-fasoracetam is about 0.70, about 0.71, about 0.72, about 0.73, about 0.74, about 0.75, about 0.76, about 0.77, about 0.78, about 0.79, about 0.80, about 0.81, about 0.82, about 0.83, about 0.84, about 0.85, about 0.86, about 0.87, about 0.88, about 0.89, about 0.90, about 0.91, about 0.92, about 0.93, about 0.94, about 0.95, about 0.96, about 0.97, about 0.98, about 0.99, about 1.0, about 1.1, or about 1.2.

367. The process of claims 343-365, wherein the molar amount of urea to R-fasoracetam ranges from about 0.95 to about 1.0.

368. The process of claims 343-367, wherein seeds of a cocrystal of R-fasoracetam:urea cocrystal Form B is added to the solution.

369. The process of claims 343-368, wherein resulting cocrystal of R-fasoracetam:urea cocrystal Form B is washed after cooling.

370. The process of claim 343-369, wherein the resulting cocrystal of R-fasoracetam:urea cocrystal Form B is dried.

371. An R-fasoracetam:urea cocrystal Form B produced by the process of any of claims 343-370.