

What is Claimed is:

1. A mixture of Form I, Form II, and anhydrate R-fasoracetam.
2. A mixture of anhydrate R-fasoracetam and Form I or Form II R-fasoracetam.
3. The mixture of claim 1, prepared by melting and recrystallizing Form I of R-fasoracetam, optionally wherein the melting was done under partial vacuum.
4. The mixture of any one of claims 1 or 3, wherein the mixture has an x-ray powder diffraction pattern comprising one or more peaks chosen from peaks at about $5.7^{\circ}2\theta$, about $7.2^{\circ}2\theta$, and about $12.9^{\circ}2\theta$.
5. The mixture of any one of claims 1 or 3, wherein the mixture has an x-ray powder diffraction pattern comprising one or more peaks chosen from peaks at about $5.7^{\circ}2\theta$ or about $11.3^{\circ}2\theta$ or both, and about $7.2^{\circ}2\theta$, and one or more of the peaks about $8.9^{\circ}2\theta$, about $12.3^{\circ}2\theta$, and about $13.1^{\circ}2\theta$.
6. The mixture of any one of claims 1-5, having at least two melting events, optionally wherein the melting is measured by differential scanning calorimetry (DSC).
7. The mixture of claim 6, wherein one onset melting temperature is at about 93.5°C , wherein the melting is measured by DSC.
8. Form II monohydrate R-fasoracetam.
9. The Form II monohydrate R-fasoracetam of claim 8, wherein Form II has an x-ray powder diffraction pattern comprising by one or more XRPD peaks chosen from peaks at about $5.7^{\circ}2\theta$, about $11.3^{\circ}2\theta$, and about $19.4^{\circ}2\theta$, optionally wherein the x-ray powder diffraction pattern further comprises one or more peaks chosen from peaks at about $16.7^{\circ}2\theta$ and about $23.3^{\circ}2\theta$.
10. The Form II monohydrate R-fasoracetam of claims 8 or 9, wherein Form II has an onset melting temperature of about 49°C .

11. Form II monohydrate having an x-ray powder diffraction pattern substantially the same as Figure 11 and/or having a differential scanning calorimetry (DSC) thermogram substantially the same as Figure 5.
12. Anhydrate R-fasoracetam.
13. The Anhydrate R-fasoracetam of claim 12, wherein the Anhydrate has an x-ray powder diffraction pattern comprising one or more peaks chosen from peaks at about $8.9^{\circ}2\theta$, about $13.1^{\circ}2\theta$, about $15.2^{\circ}2\theta$, about $17.8^{\circ}2\theta$, about $18.7^{\circ}2\theta$, about $20.3^{\circ}2\theta$, and about $22.7^{\circ}2\theta$.
14. The Anhydrate R-fasoracetam of claims 12 or 13, wherein the Anhydrate has an onset melting temperature of about 94°C .
15. Anhydrate R-fasoracetam having an x-ray powder diffraction pattern substantially the same as Figure 13.