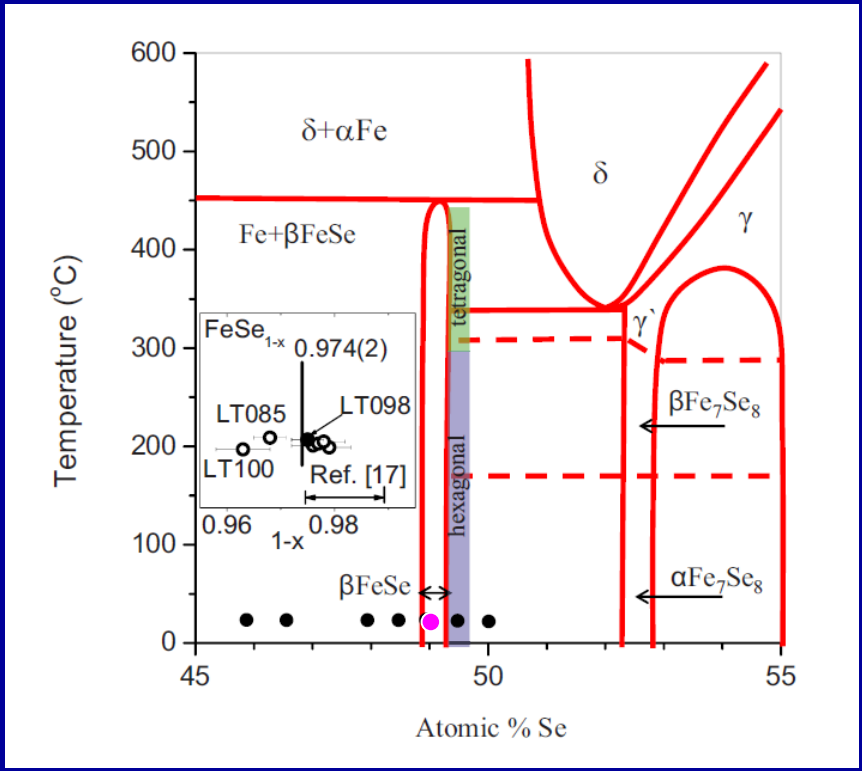
Neutron Powder Diffraction study of Fe-Se binary phase diagram in the vicinity of β-FeSe phase

Nom.comp.	Phase content		
$FeSe_{0.85}$	$FeSe_{tetr}$ 86.38%	Fe 12.46%	$FeSe_{hex}$ 1.16%
$FeSe_{0.87}$	$FeSe_{tetr}$ 91.53%	Fe 7.7%	$FeSe_{hex}$ 0.77%
$FeSe_{0.92}$	$FeSe_{tetr}$ 94.5%	Fe 4.5%	$FeSe_{hex}$ 1.0%
$FeSe_{0.94}$	$FeSe_{tetr}$ 92.92%	Fe 6.36%	$FeSe_{hex}$ 0.73%
$FeSe_{0.96}$	$FeSe_{tetr}$ 96.02%	Fe 1.94%	$FeSe_{hex}$ 2.04%
$FeSe_{0.98}$	$FeSe_{tetr}$ 98.31%	Fe 0.57%	$FeSe_{hex}$ 1.12%
$FeSe_{1.00}$	$FeSe_{tetr}$ 83.03%	Fe ~0%	Fe_7Se_8 16.51% (~18% expected)



In Fe-Se system a stable compound exhibiting superconductivity at ~8K exists in the narrow range of Se concentration ($FeSe_{0.974(2)}$)