$$\nabla^2(\sigma^{1+\alpha/2}w) = \sigma^{1+\alpha/2}\nabla^2 w + w\nabla^2\sigma^{1+\alpha/2} + \nabla w \otimes \nabla\sigma^{1+\alpha/2} + \nabla\sigma^{1+\alpha/2} \otimes \nabla w,$$