

AFM Quiz

C:\Courses\320\fall2005\inclass, etc\60-AFMinClass.wpd

(This exercise is a condensed version of one written by Jane Selverstone, available at:
http://serc.carleton.edu/NAGTWorkshops/petrology/teaching_examples/2240.html)

Consider the AFM diagrams attached to this handout. They are in order. Diagram A is for very low-grade rocks. Diagram U is for very high-grade rocks (above the 2nd sillimanite isograd).

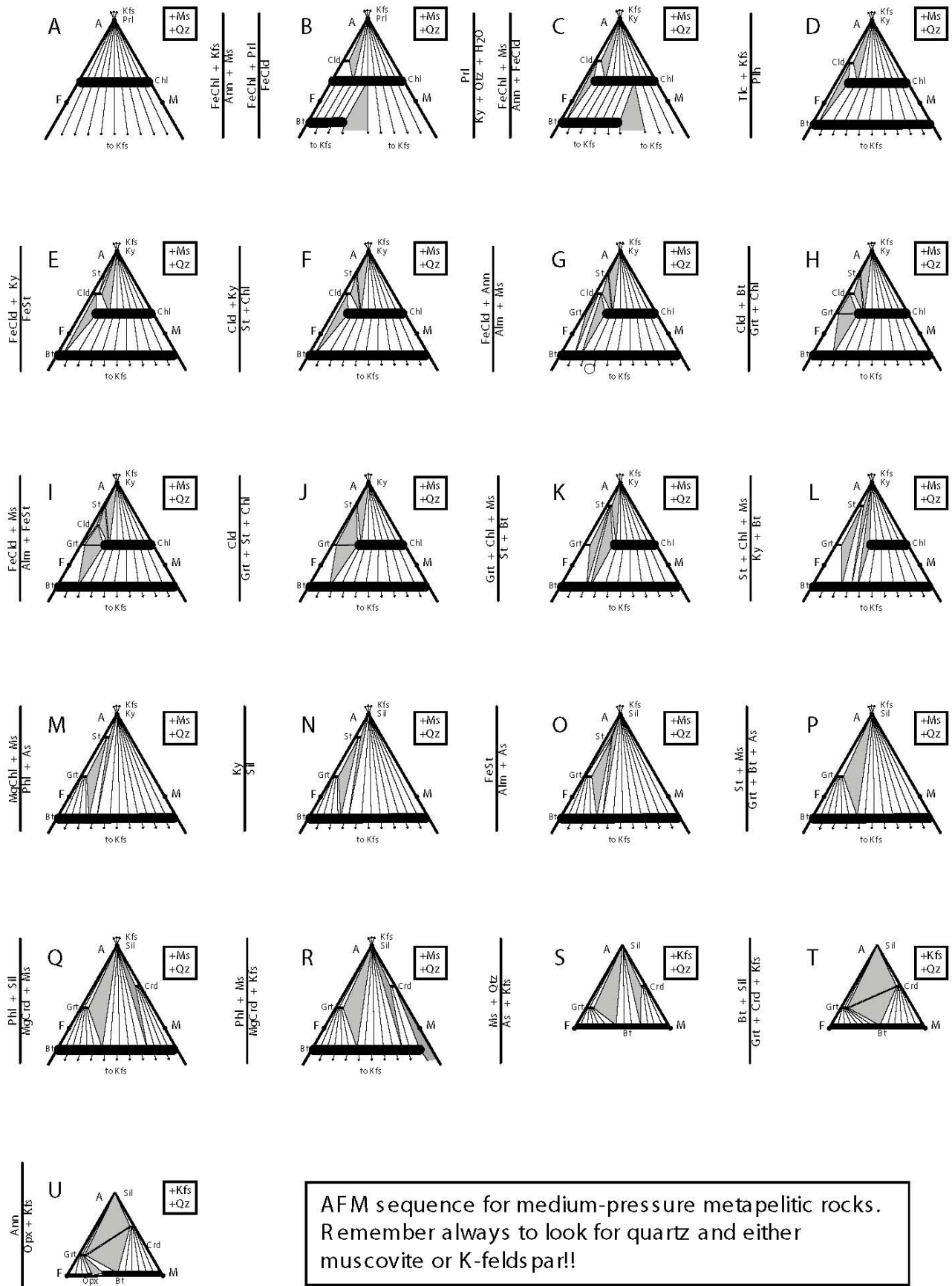
Considering only the AFM diagrams provided, in what parts of PT space will the following minerals and assemblages be stable (assuming also that quartz and muscovite or K-feldspar are present):

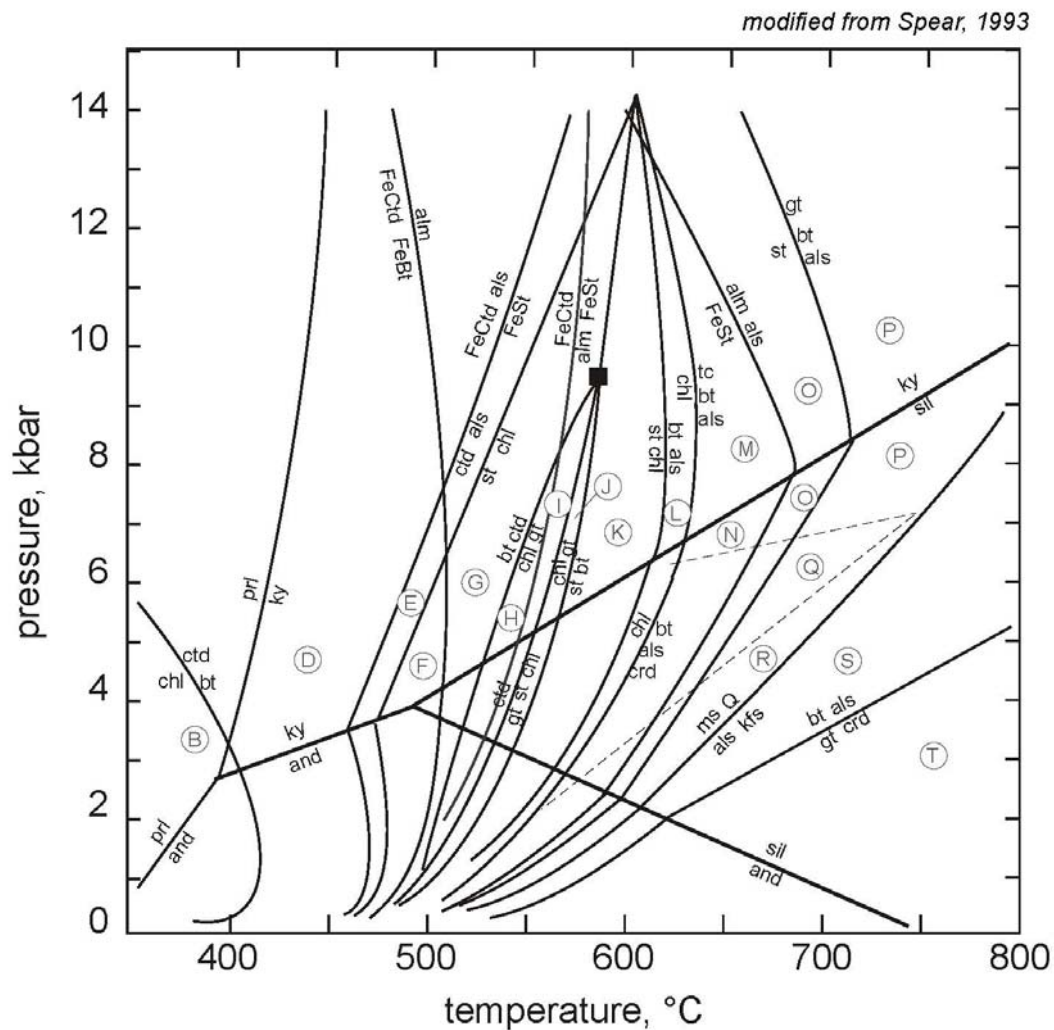
1. chloritoid
2. staurolite
3. sillimanite + K-feldspar
4. chlorite + chloritoid
5. biotite + staurolite + kyanite
6. staurolite + chlorite + garnet
7. staurolite + garnet + biotite + kyanite

All you need to do is figure out which metamorphic zone(s), designated by letter(s) goes with each.

Mineral abbreviations:

alm = almandine
als = and, ky, sil
and = and
bt = biotite
chl = chlorite
crd = cordierite
ctd = chloritoid
gt = garnet
kfs = K-feldspar
ky = kyanite
ms = muscovite
prl = pyrophyllite
Q = quartz
sil = sillimanite
st = staurolite
tc = talc





Labeled fields represent **divariant** regions; the labels correspond to the specific AFM topologies shown on the attached page.

alm = almandine	kfs = K-feldspar
als = and, kya, or sil	ky = kyanite
and = andalusite	ms = muscovite
bt = biotite	prl = pyrophyllite
chl = chlorite	Q = quartz
crd = cordierite	sil = sillimanite
ctd = chloritoid	st = staurolite
gt = garnet	tc = talc