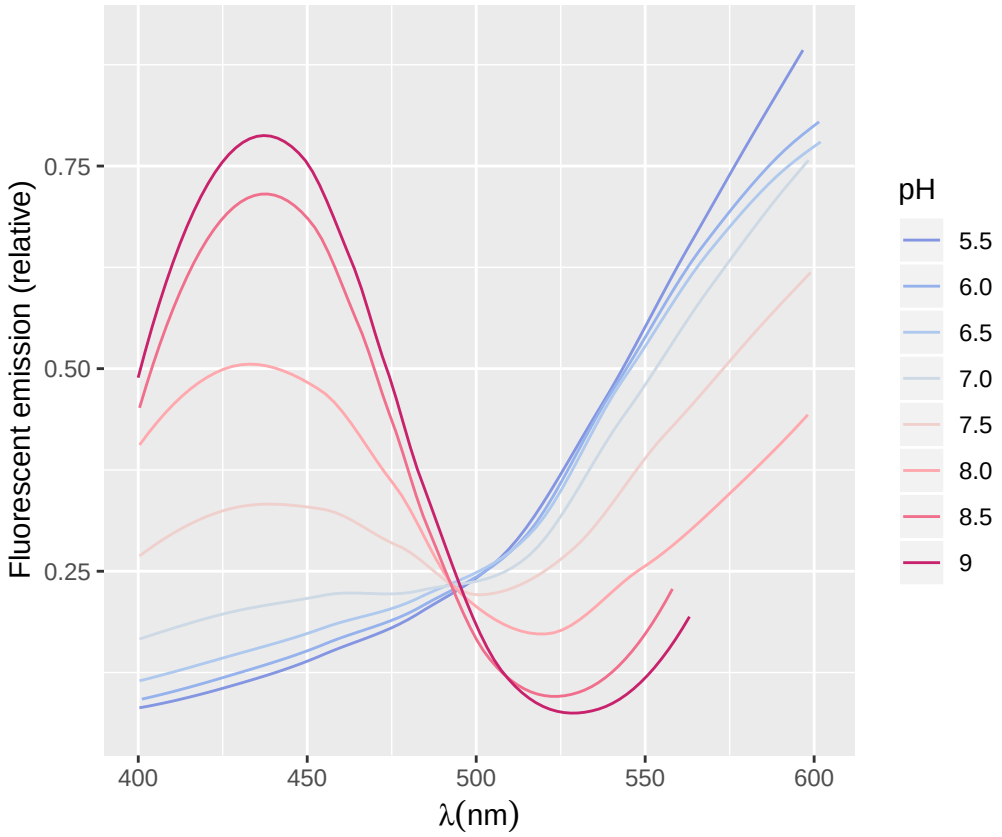
Multiple Spectra Curves pHRed

```
## `geom_smooth()` using method = 'loess' and formula 'NULL'
```

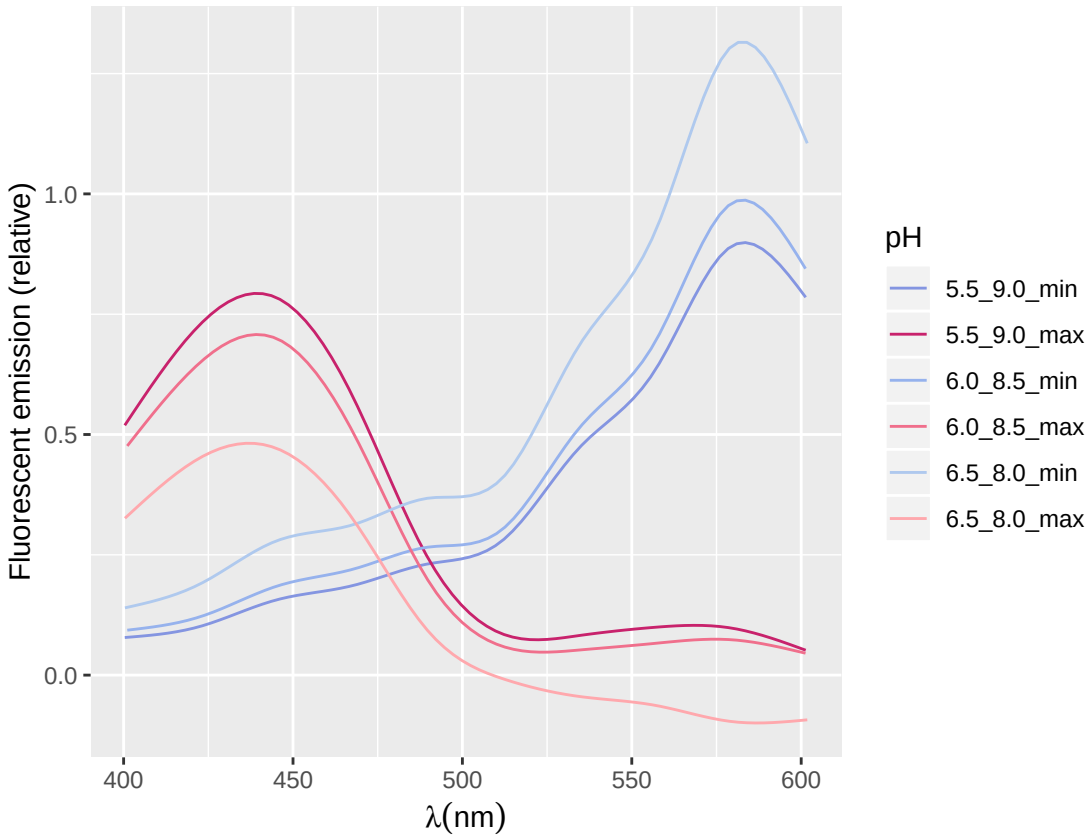


Assume a pKa of 7.8. Now we can calculate limiting curves:

For any curve, $Fraction_{Deprotenated} = \frac{10^{pH-pKa}}{1+10^{pH-pKa}}$

Here are the predicted limiting curves (for example, 5.5_9.0_min is the Rmin limiting curve predicted by the 5.5 and 9.0 non-limiting curves)

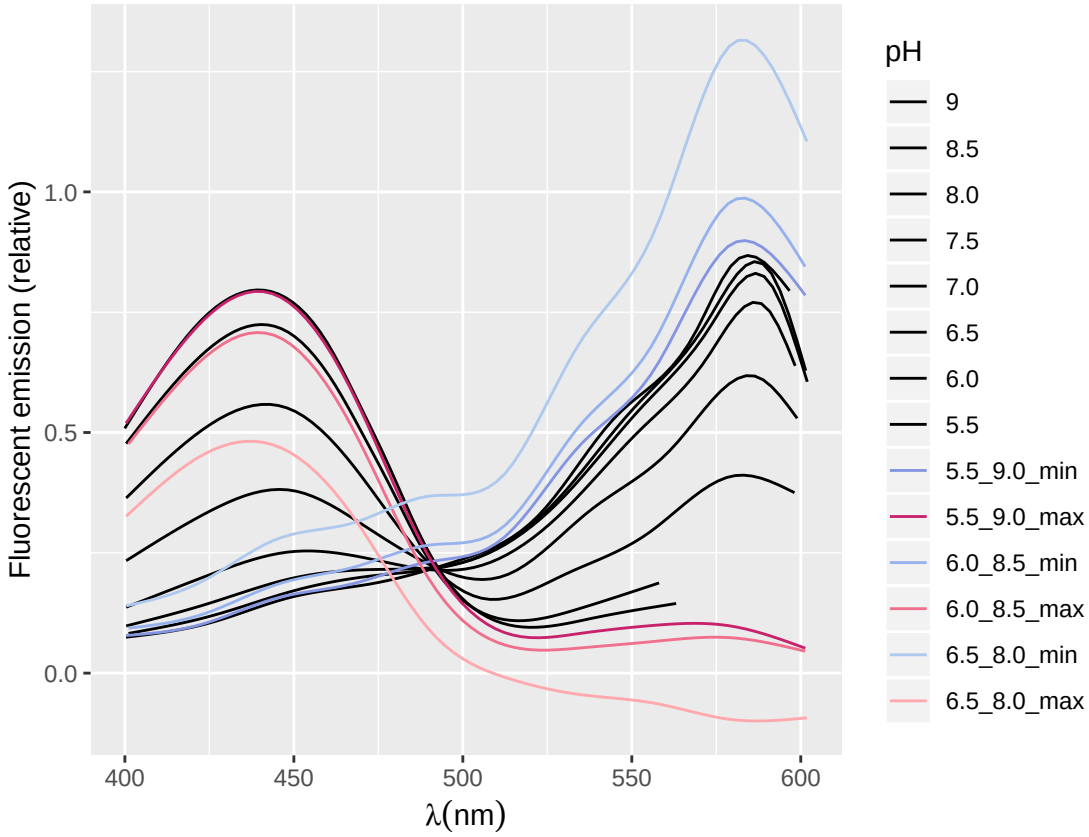
```
## `geom_smooth()` using method = 'gam' and formula 'y ~ s(x, bs = "cs")'
```



Here are those limiting curve predictions alongside the real curves.

I did compute the 7.0_7.5 curve, but it was too extreme–it had emission up to 2.0.

```
## `geom_smooth()` using method = 'gam' and formula 'y ~ s(x, bs = "cs")'
```



Finding a pKa from the graph is going to be tricky and I'll need to think about it more.