Staining SDS-PAGE gel with imidazole-zinc method

This is a method to stain protein SDS-PAGE gels with imidazole and zinc. Can be used instead of Coomassie staining, but has the following advantages:

- it is very fast, only 10 minutes for minigels
- it is more sensitive than Coomassie staining
- fixing and staining are reversible
- it is relatively non-toxic

Staining

1. Rince the gel briefly in ddH_2O
2. Shake the gel in 0.2 M imidazole for 5-10 minutes (50 ml for a minigel).
3. Discard imidazole solution
4. Shake the gel for 30 seconds in 0.3 M $ZnCl_2$. Follow development of the stain against dark background.
5. Discard the zinc solutions (collect separately and dispose off as chemical waste) and rince the gel with ddH_2O
6. View the gel against dark surface. Protein bands appear as transparent against white background.

Destaining

1. Shake the gel in 2% citric acid until transparent (5-10 min). Change the solution 2-3 times.
2. The gel is ready for example for immunoblotting (after equilibration in the blotting buffer of course).

Coomassie Staining after zinc-imidazole staining

1. Place the gel in fixative containing 10 % acetic acid.
2. Stain with Coomassie following you normal protocol.

Notes

The gels stained with zinc-imidazole can not be dried. The staining relies on the presence of SDS in the gel, and therefore is not suitable for native gels either (although you can soak a native gel in 0.1 % SDS for a while and then do the staining).
Time of incubation in 0.3 M $ZnCl_2$ is critical. If incubation is prolonged, the staining disappears. Follow the development by eye and stop as soon as background is white.
With thin gels (0.75 mm or so) the white background might not be intense enough to give good contrast. For this reason we use 1.5 mm thick gels routinely.
Gels are stable in ddH_2O for several months without noticable diffusion of bands.
Works also with tricine gels.
Gels can be photographed against dark background, black acrylic sheet is good for this purpose.

Reference

Fernandez-Patron C. et al. (1992), Biotechniques 12:564-573