Application Forum

Improved protein sample separation using GenScript's SurePAGE™ Bis-Tris gels

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Figure A: SurePAGE™ Bis-Tris gels offer superior band resolution compared to competitors' and the homemade Tris-Glycine gels. Lane 1 and 5: protein marker (MM1397), 5µl. Lane 2,,3,4,6,7,8 and 9: 10ul E. coli cell lysate. After gel electrophoresis, gels were stained with Coomassie blue using eStain™ L1 protein gel staining system.

Obtaining sharp, crisper bands on a protein gel is half way toward a successful Western blot. There are two widely used buffer system and gel chemistries, Bis-Tris and Tris-Glycine, how do they affect protein sample separation and stability differently?

In the traditional Tris-Glycine gel system (also called the Laemmli system), the pH of the gel buffer is at ~8.3. This alkaline pH causes acrylamide hydrolysis and shortened gel shelf life. During gel electrophoresis, the operating pH increases to about 9.5, which may cause protein modification and degradation.

On the other hand, in the Bis-Tris gel system, the gel buffer pH is at 6.4, this slightly acidic gel pH helps preserve protein integrity and extend the shelf life of the gel. In addition, the operating pH of Bis-Tris gel during gel electrophoresis is at ~7.3, which reduces protein modification and degradation.

Another advantage of Bis-Tris gel is that two distinct separation patterns can be achieved by using two different gel running buffers. MOPS buffer for large and medium-sized proteins, whereas MES buffer for smaller proteins (<50kD).

From Figure A, protein bands on SurePAGE were more evenly distributed compared to competitor B's Tris-Glycine gel, in which proteins in the middle parts of the gel were clustered. In addition, more bands were visualized on SurePAGE compared to both competitor B and homemade Tris-Glycine gels (zoomed panel). Lastly, SurePAGE offers slightly better resolution compared to Competitor T's Bis-Tris gel, and with no vertical "stripes".

This data indicate that GenScript's SurePAGE gel offers greater resolution and more robust separation.

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