

**Brief Presentation on Color Rendering  
for the  
California Energy Commission  
November 3, 2014**

California Energy Commission

**DOCKETED**

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TN 74092

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**Lorne Whitehead  
Professor, University of British Columbia**

## **Lorne Whitehead relevant background:**

### **Lighting industry experience**

- 10 years as CEO of high tech lighting manufacturer
- Actively involved with the IES, SID
- Director on boards of and consultants to numerous companies

### **Scientific experience:**

- Ph.D. expert in illumination, optics, vision, lighting, color, color rendering
- 20 years as Professor and administrator at University of British Columbia
- Member, Board of Advisors, for the International Lighting Commission
- Member of CIE Technical Committee 1-90, on the Color Rendering Index
- Over 100 issued US patents; applications in lighting and display industry
- Accredited Professional Engineer; **duty of integrity in serving the public good**
- Co-author of new peer-reviewed tutorial on the color rendering index





CRI  $R_a = 100$



CRI  $R_a = 80$

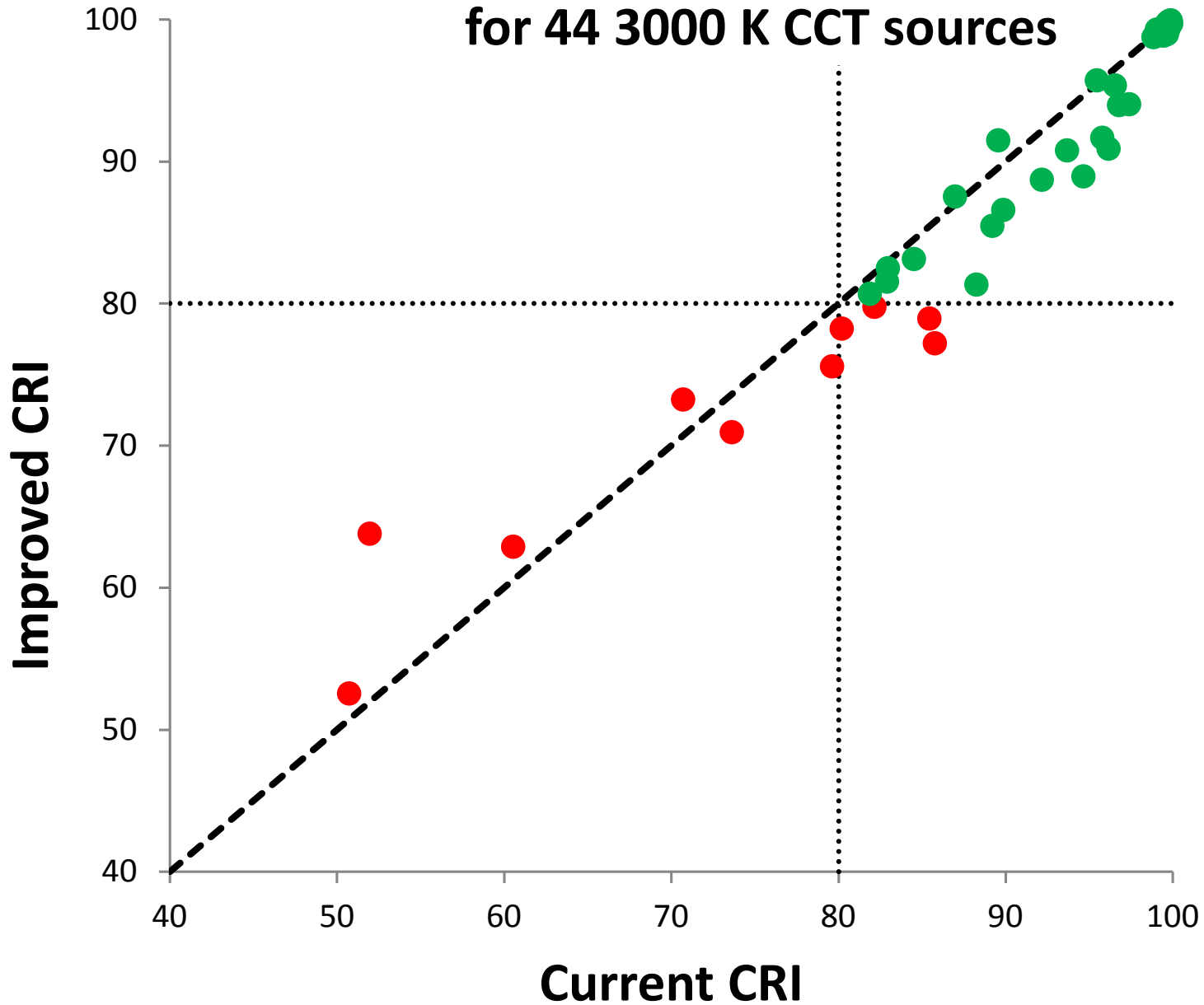
## Incorrect statements about CRI that some use to argue for low CRI requirements

1. CRI 80 has been commonplace in homes now for a long time, why change? **Irrelevant.**
2. CRI 90 will waste huge amounts of energy. **Untrue.**
3. The CRI reference source is arbitrary and probably incorrect. **Untrue.**
4. The CRI will change soon; until then we can't use it in regulations. **False conclusion.**
5. How can you suggest some major lighting manufacturers are wrong? **It's no crime.**
6. Regulating CRI would be like communism – taking away essential freedom. **Absurd.**
7. Experts say the CRI alone is an incomplete standard so why use it? **Irrelevant.**
8. No other jurisdiction requires CRI 90, so why California? **It must begin somewhere.**
9. Lamps with CRI 70 are sometimes preferred to CRI 100, disproving the CRI. **Not at all.**
10. So many people are against the CRI; they can't all be wrong! **They can and they are.**

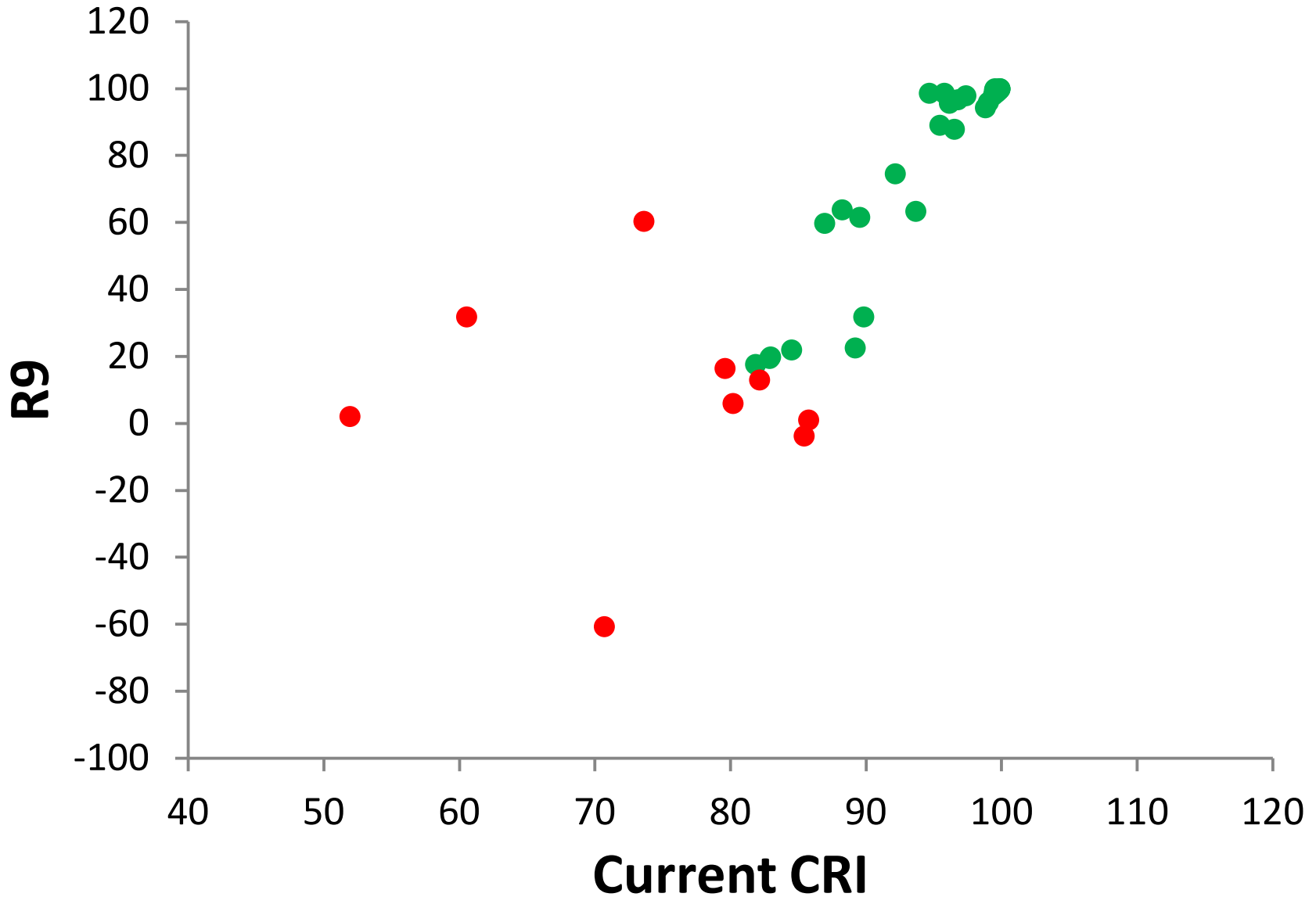
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# Improved CRI vs. Current CRI for 44 3000 K CCT sources

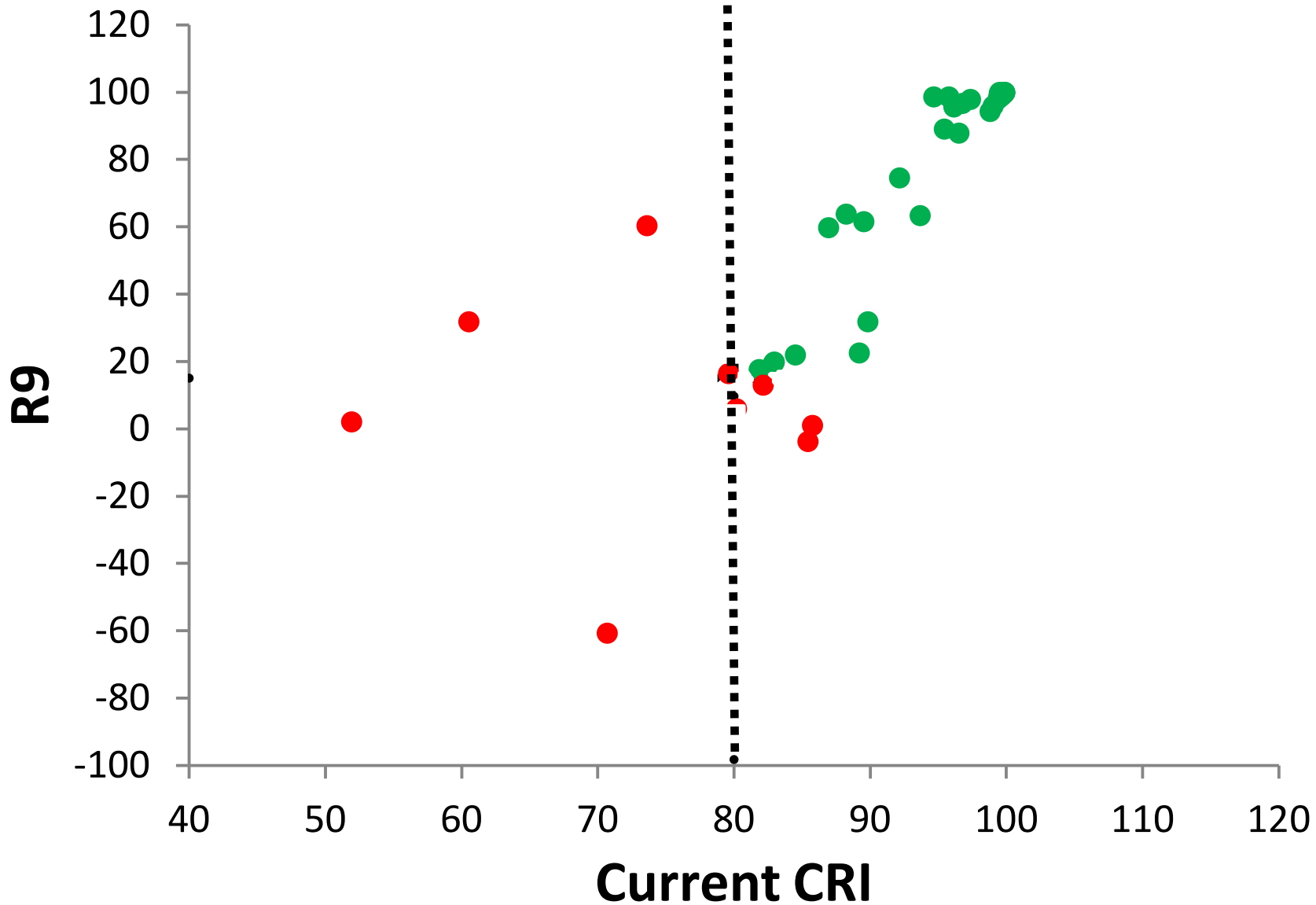


**CRI R9 vs. Current CRI for 3K CCT sources;  
10 (red) Improved CRI under 80 and 34 over 80**

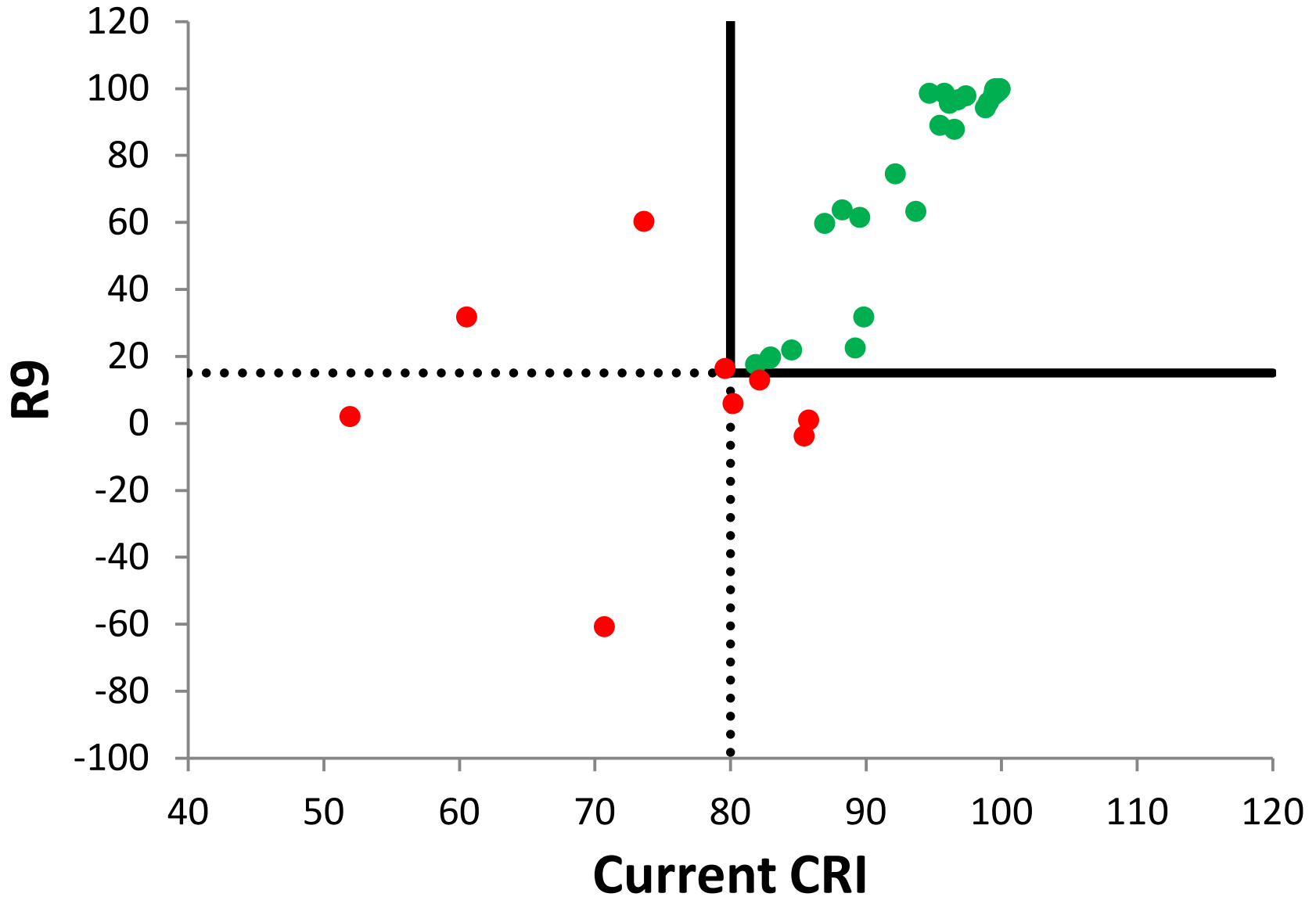




**CRI R9 vs. Current CRI for 3K CCT sources;  
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